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ORIGINAL ARTICLES

THE TREATMENT OF PEPTIC ULCER BY GASTRO-ENTEROSTOMY.*

C. H. Mayo, M. D.,
Rochester, Minnesota.

In the study of digestion as a necessary function in the maintenance of life, one comes very close to the fundamental question of life itself. The assimilation of the essential elements by plant life, singly or in combination, or in animal life by the process of the single cell, or the action of an organ, is all equally interesting and almost equally marvelous. The various activities of the cell are solved apparently only here and there, and while many of our leaders in research have undertaken the study of the special problems with a preconceived notion of the subject and its solution, their work is frequently biased and they often bridge serious difficulties by theory.

Many of the great discoveries of medical science have been developed by our army medical officers; the work was often started as a bit of scientific research to make a change in the monotonous routine in army posts. William Beaumont started the first practical investigation of human digestion and published his observations in book form in 1833. They were based on an injury to the stomach through the diaphragm of a French Canadian, Alexis St. Martin, from which injury a high, permanent gastric fistula was formed. It is of interest that much of this work was done at Mackinac, Michigan, at Plattsburg, New York, at Prairie du Chien, Wisconsin, and last, at Washington. Beaumont's work has been the introduction to, as well as the basis for, nearly all investigations in regard to gastric digestion. Among the many students of this subject, Pavlov of Russia, who based his studies on experimental fistulas developed in animals, has been one of the most prominent. Cannon of Boston has also won recognition by work on the mechanics of the stomach and the intestines.

The mechanics of the stomach by means of which the digestive fluids are produced is very delicately developed for the work to be accomplished. In this respect it is much more efficient than if it were under voluntary control, although it may quite often be stimulated and upset in its function by psychic action. By working on the theory of cell activity and its control by types of food, Sippy and his followers, taking advantage of the action of fats in delaying digestion and reducing the acidity with the additional administration of alkalies, have developed a very good system of control of the acids by variation in diet and by frequency of administration of food. Unquestionably, much may be accomplished along this line. I would take issue, however, with the statement that gross gastric ulcers are comparatively frequent or that they are readily healed. Such ulcers are rarely multiple and the heavy induration backing the ulcer prevents healing by preventing approximation of the mucosa. Ulcers of the stomach must be destroyed by perforation, by cautery or excision to accomplish such approximation. I do not believe that true ulcers exist without evidence on the surface or in the tissue, although surface ulcers, as described by Beaumont, aphthous in type, do occur in the stomach mucosa as well as in the mouth, and heal without leaving a scar.

Gastric and duodenal ulcers are probably the result of local thrombi from an infection by a certain group of streptococci which grow in an

*Presented before the Minnesota State Medical Association, August 29-30, 1918, Duluth, Minn.

acid field. Such ulcers are found four times as often in men as in women of every walk of life, in every country, and under every condition except that of non-acid stomach. They are not caused in man by traumatism of the mucosa through bones or foreign bodies such as fowls naturally take as aids to digestion. About 80 per cent of gastric and duodenal ulcers appear in the first portion of the duodenum in which each bolus of acid chyme remains until neutralized. Occasionally the bacteria are undoubtedly carried in the blood stream from a local focus and at times bacteria enter the chyle duct from the intestine but do not attack the mucous membrane except as infarcts in its capillary circulation, in the rear, so to speak, and the area involved is at once attacked by the pepsin in an acid medium. Rosenow, in his research work, produced gastric ulcers in a very large percentage of instances by injecting into the blood stream of animals bacteria derived from gastric ulcers.

The patient who is suffering from gastric ulcer describes attacks of stomach trouble of a few weeks duration, which alternate with periods of a few to many months of good health; the attacks, however, become more frequent or continuous as the condition becomes chronic. The patient speaks of pain, of burning on an empty stomach three to four hours after eating, of sour, burning eructations in the night; of food ease, and later, soda ease, because of the dilution or neutralization of the acid. The passage of food over the ulcer is always a relief. The acid and pepsin covered ulcer in the food-empty stomach or duodenum is the cause of pain, as the stomach when empty of food often contains a quantity of gastric secretion induced by pyloric spasm. It is evident that duodenal alkalies do not respond to gastric acids as do the pancreas and liver.

Occult blood is of but little aid in making the diagnosis of gastric ulcer. True hemorrhage occurs in 25 per cent of cases. Close questioning of the patient concerning the appearance of bloody or dark stools may give a much higher percentage than this. The x-ray gives very conclusive evidence in about 95 per cent of cases; failures in diagnosis are usually due to reflexes from the gallbladder or appendix to the stomach.

Sippy has done much to establish a basis of medical treatment of ulcer. He has shown that pepsin must have free acid above five points (the higher the better) in which to work. His principle of treatment in an attack is, therefore, to reduce the acid content by dilution of food or by neutralization with alkalies every hour during the greater part of the day. Milk and fats dilute the acid and delay digestion, with a gradual reduction of acidity.

It is just as much a fallacy to say that a peptic ulcer is always cured or healed after an attack is over, as to consider an ulcer of the leg healed after painful extensions have become quiescent. The higher the free acid the more active the pepsin; combined acids (as in cancer) activate pepsin but slowly; the pain in the latter cases is therefore due to peristalsis. Whatever the degree of acidity, neutralization must occur in the area of Brunner's glands in the upper portion of the duodenum. The circular muscle of the duodenum about the region of the common duct holds each acid bolus in the first two and one-half inches of the duodenum until the mass, regardless of the number of ineffectual persistaltic waves in the pyloric portion of the stomach, is neutralized by duodenal secretion to prepare for the alkaline digestion. When the mass is neutralized and alkali touches the pyloric ring, the next bolus will be delivered to pass through the same process. The neutralized chyme passes on to be acted upon by the pancreatic juices and the bile fluids, the latter aiding in emulsifying fats. Only within this neutralizing field of the duodenum can an ulcer occur. The duodenal secretion is stimulated less by gastric juice than by food. Eating stimulates the essential digestive preparation which is alkaline; the acid is convenient and essential for the preparation of certain foods but is not essential to life. The acid activates the secretin in the mucous membrane of the upper intestine, although secretin appears as an activating agent without acid, and thus stimulates the pancreas to secretion. We often see patients who complain but little while under observation, yet who show a non-acid stomach for months and years. Some few persons, supposed to possess non-acid stomachs have a thirty minute period of acidity within the hour after eating. Those

with non-acid stomachs have a relaxed pyloric sphincter, which may be seen when of necessity the bile is delivered by operation into the stomach. Persons with hyperchlorhydria do not have spells of trouble; their trouble is continuous and is caused by a spasm of the pyloric sphincter with a retention of many cubic centimeters of acid and gastric juice, and occurs on a food-empty stomach. They are relieved by taking soda or food; even a few peanuts or kernels of popcorn is a mucous stimulant and develops the duodenal secretion, without which the alkali will not bring about the relaxation of the pyloric muscle and the relief sought. A lack of balance between the gastric acids and the duodenal alkalies of digestion is probably the cause of gastric ulcers, as a biochemic factor allergic to a group of acid-growing streptococci.

Paterson has shown that the acids in the stomach are lowered about thirty points after gastro-enterostomy. After the stomach has been emptied of food, the duodenal secretion ceases and the pyloric spasm ensues, some bile and the alkaline intestinal secretion are then found mixed with and diluting the acid secretion remaining in the stomach. After gastro-enterostomy for duodenal ulcer, the greater part of the food will pass through the new opening for some weeks; later, after healing is complete through the natural peristaltic efforts of the stomach, the new outlet divides its work with the pylorus. Healing follows upon the lowering of the acid mediums and a chemical change occurs in the natural environment of the bacteria which enables natural immunity agents to deal with them and their results. The patient makes use of his own drug store for neutralization, so to speak, and the effects of the spasm of the pylorus are overcome by the new opening. An ideal gastro-enterostomy would make possible a trap-door which would close when food was taken and open after all food had left the stomach and duodenal secretion had ceased; this would permit gastric secretions to pass through as well as to be diluted through its opening; thus the effects of spasm of the pylorus would be overcome until food is again taken and duodenal secretion again occurs.

Rarely after gastro-enterostomy a new crop of bacteria, or a change in the type of the old, infects the new opening, and as a result gastro-jejunal ulcer appears. Silk suture material may, in some instances, be a cause of the induration and irritation seen about the ulcer area; in 80 per cent of such cases seen by us, the silk suture in the field was exposed to the gastric juice from one to four years after operation.

Perforation of a gastric or a duodenal ulcer occasionally occurs, but death does not usually follow, because protective adhesions develop to prevent general infection.

Thirty-eight per cent of all cancers found in man are in the stomach. They are less frequent in women than in men. Because malignant growth occurs in acid fields, the destruction of gastric ulcers should be undertaken as a prophylactic measure. Since ulcers of the duodenum occurring in a naturally alkaline field rarely develop into cancer, extensive operation is not necessary as a preventive.

In peptic ulcer of the stomach and duodenum gastro-enterostomy becomes a mechanical agent in the overcoming of biochemic conditions. The modern treatment of peptic ulcer of the stomach and duodenum by gastro-enterostomy is so satisfactory a relief that a discussion of its development may be an aid in establishing measures of diagnosis as well as of treatment.

The early surgical treatment of ulcer by suture anastomosis, was employed only in operations of necessity, in acute perforation, in obstruction, chronic and increasing, and in cases of severe (continuous or recurring) hemorrhage.

Various mechanical devices have been invented partly as an aid, and partly to share with the operator the credit for the results which were frequently good but often bad. Nicholas Senn advanced Connell's bone plate; next the late J. B. Murphy, the world's greatest surgical teacher, produced his mechanical device, the button. To the Murphy button should be credited a large share in the development of intestinal surgery. The Mcgraw elastic ligature enjoyed a brief period of experimental use. Later came the Mayo-Robson bone bobbin which served as an absorbable framework over which anastamosis of a definite size could

be made, but these were not extensively employed. The suture method has gradually developed and it is displacing all other methods. The button is still occasionally employed in special conditions.

First silk, then silkworm gut, Pagenstecher linen, plain linen and, later again, silk, followed last by chromic catgut, have displaced one another as popular suture materials.

The first operations were anterior gastro-enterostomies by the long loop of jejunum drawn over the front of the transverse colon and attached to the anterior wall of the stomach with the bowel turned for iso-peristalsis. If there was marked obstruction, the operation gave great relief. Later came the posterior attachment; by this method the stomach was united to the bowel through a small rent made within the loop of the middle colic artery in the mesentery of the transverse colon. Then commenced the problems of gastro-enterostomy, for, as knowledge of the symptoms of ulcer and improvement in the technic of its treatment increased, the operation was no longer one of necessity only; it became one of expediency.

The fact that the stomach is an organ largely affected by reflex disturbances from the eyes, the mind, the pelvis, the appendix, the gall-bladder and the nervous system, was often overlooked, and operations for ulcer, as based on symptoms, were common. The long posterior or nine inch loop often developed vicious circles; to avoid these, the loop was united proximal to the gastro-enterostomy by suture or button, the Y or Roux operation was devised, the pylorus was excised and its ends closed, or it was obstructed. It was believed that if food left the stomach in a new way the gastric ulcer was relieved even when the pylorus was normal and without obstruction. The operation was changed by a few surgeons to plastic methods of enlarging the pylorus; the Heinecke-Mikulicz operation, the Finney operation and various plastic gastro-duodenostomy methods were devised which overcame obstruction due to spasm of the pylorus without changing the acidity. At this time the short loop and, later, the no-loop methods were devised. Most surgeons became aware that gastro-enterostomy was an added burden to the patient with gastric reflex disturbance, and insisted on seeing the ulcer before operating on the stomach; or, if the ulcer could not be seen, rather than make an unnecessary gastro-enterostomy, they investigated abdominal sources of gastric reflex for relief. The twist in the bowel for iso-peristalsis, as made in the long loop anterior operation, had been preserved in the posterior methods, and while it made no difference in the original method, the splenic loop, continuing the bowel to the left after crossing the spine, was twisted back upon itself, and in a truly short loop tended to obstruction in a certain percentage of cases. This led to more methods of blocking the pylorus by suture, by folding ligatures, round ligament, fat, fascia, and excisions, which were intended to force the stomach to utilize the new outlet. All of these measures were unnecessary from every standpoint, unless an ulcer on the gastric side of the pylorus, as a tumor which potentially might develop cancer, should be removed. It was soon learned that gravity played no part in the emptying of the stomach, that it would remain dilated unless it was relieved by its own peristaltic efforts, and that these efforts could not overcome obstructive conditions in the intestine. If the latter were present the stomach would dilate and give trouble until the obstruction was relieved. Two other conditions would also cause it to dilate, first, injury of the innervation from wide excisions of ulcers on the lesser curvature; and second, interference with the mesenteric circulation, which often could be relieved merely by turning the patient on the left side or upon the face. The dilatation from paresis required lavage of the stomach, often over a period of from two to five weeks, until innervation was restored. As excision is now made by the Balfour cautery method, which destroys only the ulcer, paresis seldom occurs.

The best type of gastric cases for surgery is that in which every method of medical treatment has failed, or the patients have become tired of the rigid diet and care which is necessary to relieve or to prevent relapse. Such patients greatly appreciate the relief obtained through gastro-enterostomy, and the ability to return to work with the diet that can be obtained by them in their station and environment.

PERSONAL EXPERIENCES CONCERNING THE OPERATION FOR SENILE CATARACT.

FRANK ALLPORT, M. D.,
Chicago, Ill.

This paper is not intended to present any new facts concerning operations for senile cataract. I desire merely to outline my own personal views on the subject; to tell what methods I like best and what procedures have given the most satisfactory average results in my hands. I do this because the profession is somewhat at variance as to the best methods of operating, and the long experience of any man of average ability, experience and surgical skill must be of more or less value in its influence. It is only by the frank and honest exchange of personal views and the surrendering of desired and brilliant, but perhaps impracticable, technique, that we will ever find our feet resting on solid ground and the cataract operation placed in a secured position, from whence it cannot be disturbed except by strong and indisputable evidence.

The object of this paper is to narrate in a simple manner my own method of operating; not that I consider it better than other methods, but it is merely the routine that I have found most satisfactory to me. Other operators have other methods that very likely are better than mine, methods that seem to suit their particular needs, and it would be a mistake for them to change unless they sincerely desire to do so. Neither shall I attempt to go into details concerning all the steps of the operation, as this would obviously be almost intrusive, as there are, of course, some things that everybody does—no matter what may be their practice in other respects.

In the first place, I never operate upon more than one eye at a time.

Patients should be twenty-fours in the hospital before a cataract operation is performed. By so doing they become accustomed to their surroundings, are more quiet, and will act better on the operating table. The bowels can be gently moved and a careful diet prescribed so that indigestion will not be troublesome after the operation. Besides this, the eye can be carefully prepared for the ordeal by being irrigated three times a day with a 1/10,000 bichlorid solution, followed by the use of White's bichlorid ointment. An hour or so before the operation the pupil should be dilated with atropin and the lashes should be gently but firmly scrubbed with 1/10,000 bichlorid solution and gauze, to get them as clean as possible. The entire face—eyes, brows, etc.,—should be well cleaned, and after the patient is on the operating table the face should be again washed, the eye irrigated and the lashes and eyebrows gently scrubbed.

It is better to operate on the bed where the person is to lie or perhaps in the same room or ward or, at least, to have the patient moved as little as possible after the operation. If the patient is moved from an operation room to a private room or ward, the moving should be done as quietly as possible and superintended by a reliable and conscientious person. The patient should not help himself at all.

I always wear thin, tight-fitting, rough-surfaced gloves. The operation is much safer and I can handle delicate instruments perfectly well with them on.

Good illumination of the field of operation is essential to the best operating. I prefer a hand electric light with condenser, and a glazed globe. Besides this—a trained assistant focuses accurately a large convex lens on the eye, between the hand, light and the eye.

My associate, Dr. James Smith, has devised what I consider to be the best light for a cataract operation that I have ever seen.

He has merely taken a Ziegler hand lamp and fastened it to an arm that projects out beyond the light. To this arm is attached a roundish concaved bifurcation, into which can be slipped any strength of convex glass to be found in a trial case. This glass slips in the bifurcation just as a glass is slipped into a trial frame. In this way a stronger or weaker glass can be inserted and a corresponding focus of intense illumination thrown accurately upon the eye.

I like the hand lamp much better than the stationary lamp, as you can put it wherever you want it. This addition to the Ziegler light, devised by my associate, Dr. Smith, produces an ideal illumination for a cataract operation.

These lights will be manufactured by F. A. Hardy & Co., Chicago.

All water used for cleansing and irrigating should be warm. It should not be dropped on the eye from a distance, as this startles the patient and may make him jump, which would be especially unfortunate after the eye has been opened by the incision, as under these circumstances jumping and squeezing of the eye may be very unfortunate.

The speculum should be introduced gently and the patient told what is being done. Be careful not to press on the arms of the speculum.

Teach the attendants and the patient to keep quiet, and reassure the patient by a friendly word once in a while, telling him what is being done in order that he may not be taken by surprise.

When the initial puncture of the incision is made, the handle should be elevated a little so that the knife does not pass between the corneal layers, but directly through them all. When the counter puncture is made in the opposite side of the cornea, the handle should be somewhat depressed, as otherwise the knife is liable to pass too deeply into the eye and into the sclera.

I use a solution of 1 per cent. holocain with 4 per cent. cocain, and I always put a drop in the eye not operated on, as it induces more ocular quietude.

If a conjunctival flap is made, a few drops of adrenalin should be used, as otherwise considerable hemorrhage will occur, which may flow into the anterior chamber and embarrass the operator and lessen the chance of a successful result. A conjunctival flap lessens the chance of infection and hastens healing.

Before the iris is cut, a drop of the holocain and cocain solution may be dropped upon the incision, which will obtund sensibility. The patient should be told that this step in the operation may be a little painful, and he should be cautioned not to jump. Where it is possible, I very much prefer to make a preliminary iridectomy. I am confident that this renders the cataract extraction much safer and surer. There are several reasons for this opinion. In the first place the attack on the eye is divided into two parts: first, the iridectomy, and second, the removal of the lens. It is easier to recover from a thus divided assault than if both are done at the same time. Besides this, if the iridectomy is done separately, there is very little and sometimes no hemorrhage when the lens is removed, which of course greatly facilitates the operation. Another important reason for a preliminary iridectomy is, that a patient, by having once gone through the iridectomy operation, always behaves better when the real cataract operation is performed. I might say at this juncture that I consider the cataract operation with an iridectomy a safer and surer operation than the operation without an iridectomy and for this reason I always make an iridectomy.

The iridectomy should be as small as possible and this can be done by holding the scissors vertically, instad of horizontally.

After the iridectomy, I take out the speculum, as this renders the escape of vitreous much less likely to occur. I then pull up the upper lid with a strabismus hook and rupture the capsule with the cystotome, which should always be very sharp so that the capsule can be easily and accurately ruptured. The assistant pulls down the lower lid with his finger. In this way the eyelids are freely opened without pressure on the eyeballs. I then press upon the lower portion of the cornea with a spoon, to gently coax the lens from its bed and at the same time gently press upon and depress the posterior lip of the incision with another spoon in order to open the wound and encourage the escape of the lens, which should always be slowly and not suddenly delivered.

For the last few months I have been using the lid elevators of my friend, Dr. W. A. Fisher, of Chicago, instead of a speculum, and wish to say that I regard them as infinitely superior to any speculum that has ever been devised for a cataract operation. An assistant inserts one

elevator under the upper lid and another under the lower lid. The two elevators are then gently but firmly separated and raised, thus opening the palpebral space to its fullest capacity. This provides a wide operative space and at the same time maintains a control over the lids, orbicularis muscle, etc., unobtainable in any other manner. The danger of winking, lid movements, etc., is thus eliminated and the operation, therefore, made just so much safer. The assistant, while spreading the lids apart by the elevators, should at the same time lift the lids from the eye, thus preventing all pressure on the eyeball and very much lessening the liability of escaping vitreous. The freedom from this accident renders the expulsion of the lens much easier and safer. If the anterior chamber is irrigated, it can be done with much greater assurance and safety than by any other method. I leave the elevators in until the end of the operation and then gently remove them.

Great care should be taken that the upper lid and lashes do not pass into the corneal space made by the incision. This might produce infection. In case the lens seems too large for the incision, its forcible exit should not be encouraged, but the incision should be carefully enlarged by small, curved, round-pointed scissors.

After the lens has been delivered and any remaining lens substances gently stroked out (that can safely be delivered), I carefully wash out the anterior chamber with warm, sterile normal salt solution with a specially devised irrigator, which I here exhibit. This consists of a rubber bulb, large enough to fit the hand. The rubber should be of the best quality—soft and pliable—and should not flake so that particles from its interior can be found in the solution. Some years ago I devised this irrigator and had it made with a glass end, about the same shape as a strabismus hook, only flattened in such a direction that the hand enclosing the rubber bulb could be at the side of the patient, instead of above the eye, which is always a constrained position from which to operate a bulb with a bent end. The glass end proved to be difficult to make correctly and uniformly. Besides this, it broke easily and was a source of considerable annoyance. I, therefore, had an end made of gold and since then have had no trouble with the irrigator. It is made by F. A. Hardy & Co. of Chicago, and is sold for $15.00. It is a perfectly satisfactory anterior chamber irrigator. Not much force should be used. Loss of vitreous should be borne in mind and air bubbles should be ejected from the irrigator before it is used. In an unmanageable patient I sometimes am afraid to use the irrigator, as a sudden upward turn of the eye, or a quick motion, might inflict irreparable damage. I prefer to leave some cortical substance and take care of it afterward by a needling or some similar operation, if it proves to be necessary. I take great care, however, to free the incision of all debris. The pillars of the coloboma should be carefully replaced by a spatula with stroking movements outside the cornea, if possible—inside the cornea, if necessary. The bichlorid and atropin ointment of Dr. White, of Virginia, is then placed inside the lids with a probe and a suitable dressing over both eyes is applied. An aluminum shield is also placed over the operated and slightly covered eye. In two or three days only the operated eye is protected.

I give a chloral hydrate and bromide of potassium mixture at bedtime for one or two nights to insure rest.

I have the hands gently tied with a bandage cloth to the foot of the bed for a few nights, and if possible, secure the services of a day nurse and night nurse for nearly a week to constantly watch the patient and administer to his wishes.

I usually secure immobility of the bowels for two or three days by giving a small hypodermic dose of morphin. I then give a mild laxative.

I trust I may be pardoned for dwelling upon these simple details of the management of cataract cases. It may be borne in mind, however, that such operations are essentially a chain of small, fussy details, and the operator who most carefully observes details will, other things being equal, obtain the best results. I also request that these fragmentary notes shall not be regarded as a description of the cataract operation. They are merely intended to convey to your minds some of the details that I have found useful in my operative work.

PARAFFIN TREATMENT OF BURNS.*

ARTHUR N. COLLINS, M. D., F. A. C. S.,
Duluth, Minn.

Finished discoveries rarely emanate from one mind. The collaboration of several investigators is commonly necessary to the discovery for its elaboration and before it is made usable for the many. One may mention that our present day familiarity with bacteriology is founded upon the discovery by Latour in 1836 of the living character of micro-organisms. Twenty years later Pasteur showed that putrefaction is produced by "living ferments," and Lister, acting on these advances made by his predecessors, applied to wounds certain agents to kill these contaminating micro-organisms. In this way the principle of antiseptics was evolved.

Undoubtedly burns have occurred since the discovery of fire. The role of treatment of burns has engrossed physicians, and applications of many kinds have been used by them down through many generations. One has merely to consult his texts in order to find described numerous methods, drugs, ointments or applications for the soothing and healing of burns; and still dissatisfaction reigns. The most recent advance, one which has attracted greater attention since the advent of the present Great World War in Europe is the principle of covering burned surfaces by a paraffin coating to exclude the air. This was done first, so far as known, by a French physician some sixteen years ago. After considerable experimentation he devised a preparation known as "Ambrine" (the excellence of which seems to be marred chiefly by the fact that the originator chooses to keep his formula secret). The main constituent of this preparation is said to be 96 per cent paraffin.

I. To show even smoothness in removal of the paraffin crust. Shows also the wrist dark and jelly-like on the surface where it is denuded of skin contrasted with the white paraffin and cotton dressing.

II. The hand after sloughing skin was removed. Note the numerous islands of skin appearing all along the arm. First, second, and third degree burns

Acting on the suggestion that the paraffin coating on the burned surface contained the essential element of value in the healing of the burn, many clinicians have proceeded to use it as such. Beiter found that in attempting to use resin in the paraffin, the resin would sink to the bottom of the melted paraffin, and when applying it with a brush the resin caused pain. He therefore recommends the paraffin alone, or occasionally tints the paraffin pink for cosmetic reasons.

In the cases which will be shown here, plain paraffin has been used with a dilution of two

*Presented before the Annual Meeting of the Minnesota State Medical Association, Duluth, August 28-30, 1918.

III. Burned area on the back. Note patches of sloughing skin; also dark spots around the lower edge representing pustules present on admission.

per cent paraffin oil. As pointed out by Beiter, it is inexpensive, clean, comfortable—especially so at dressing time—fewer furuncles occur when it is used, and superficial burns heal with astonishing rapidity. The deeper burns heal slowly under any method so far known. They frequently require skin grafting. The scar tissue in first and second degree burns is soft and flexible treated by this method. The removal of gauze dressings is a painful procedure and is always dreaded by the patient. The removal of the paraffin crust is practically painless. With the removal of the gauze mesh many minute skin granulations are torn from their bed and the healing process therefore receives a setback. When the paraffin crust is applied there is a smooth, flat, moist and moisture-proof surface which presses gently upon the new forming island of skin and encourages its peripheral spreading and junction with neighboring islands of skin. Very soon after the application of the paraffin coating to the thoroughly dried surface there interposes between the paraffin crust and the burned surface a secretion of lymph. This is held to the burned surface by the paraffin crust and furnishes a normal moist medium for the encouragement to growth of the islands of skin. It is this lymph lake which is responsible for the painlessness when the paraffin crust is removed. The crust does not adhere to the surface and the nerve endings are not molested.

The writer in dressing his burn cases has made use of all the useful suggestions he could assemble in applying the paraffin method and he has found that the burns heal kindly and rapidly. In applying the dressing to a fresh burn for the first time, no attempt at cleansing the surface is made beyond spraying lightly with a 3 to 5 per cent solution of dichloramine-T. over which the paraffin is painted. Blisters are punctured but not removed, at the first dressing. A child with an extensive burn of the chest and abdomen, writhing and screaming with pain on admission, ceased crying immediately and smiled after thus applying the para-

IV. Showing burned area of back, pustules scattered over the rest of back and burned area of under side left arm and axilla, the latter chiefly third degree burns.

V. Showing process of trimming loose sloughing skin. Shows also numerous islands of skin spreading and coalescing with each other.

ffin crust. At subsequent dressings any loose or sloughing skin is trimmed off with sharp scissors. This may be painful if trimmed too close. The secretions are removed by spreading smooth sheets of sterile gauze over the surface and blotting by gentle pressure. A cotton pad with a twisted pedicle for a handle may be used for this pressure. The surface is then ready for drying. This is done with an electric hair drier or blower, and the drying should be thoroughly done. Where there is infection or sloughing skin with accompanying foul odor, the dried surface is then sprayed with dichloramine-T. In some places this may cause pain, and the writer has found if this is immediately covered with paraffin oil sprayed on, the pain is relieved. For this purpose two atomizers are held in the left hand while the spraying-bulb is operated with the right. One contains the dichloramine-T in an oily solution, and the other contains sterilized paraffin oil. If at any time during the application of the dichloramine-T the patient complains of pain, the paraffin oil may immediately be sprayed on at that point. The surface is then ready for the paraffin crust. Ordinary paraffin with 2 per cent of paraffin oil to increase flexibility is used. The mixture is heated in a double boiler and is brushed on. It may be used in a paraffin atomizer with a water jacket if preferred. It may be cooled down until a few drops on the back of the hand or wrist are not uncomfortably hot. It is daubed on gently at first. Much stroking with the brush over the raw surface seems to cause pain. The raw surfaces are covered thinly at first. If the patient complains of the heat, an assistant may apply the electric blower or drier to cool the freshly-coated surface following the brush. After the burned surface has been coated gently and is hardened, a second coat is freely applied and this coat is extended outward for one or two inches onto the surface of the healthy skin. Before this dries, thin sheets of cotton fibre being ready, are spread over the soft crust and are brushed over with the paraffin which impregnates the fibre with the crust. When this is hardened, absorbent cotton is placed thickly

VI. Drying the surface with electric hair drier or blower. Loose skin flaps are thus disclosed, the current of air having raised them from the surface.

VII. Spraying the surface in places with dichloramine-T after the drying is complete.

over the most dependent edges to absorb secretions which commonly leak out. The dressings over large body-burns may be held in place by a band, swathe, slit nightshirt or other device which may later be cleaned, sterilized and used again, thus contributing to a large saving in bandage material. The dressing is renewed in twenty-four hours.

It has been said by some critics that with the paraffin method an infected wound is covered with a sealed dressing. The writer has found that infection rapidly disappears with the use of the above method. It is also said there is no way of controlling the temperature of the paraffin; that it is too hot at 212 degrees and too cold at 144. The writer has found if the paraffin is applied in conjunction with the blower the pain is reduced to the minimum and is only momentary. Certainly compared with the painful removal of gauze dressings according to the older methods, and considering the rapid proliferation of skin particles, the paraffin method is beyond reproach. The patient frequently reiterates how comfortable the dressing feels.

It is to be hoped that the last word has not been said by investigators along this line of treatment. Sollman suggests that further improvements be attempted by the addition of antiseptics, stimulants and especially anesthetics, to the liquid petrol of the first coat, and that a systematic comparison of these improved methods with the older methods is desirable. The writer believes these suggestions very important and ventures to assume that with such improvements practically incorporated with the present basic foundation, the treatment of burns will have been essentially standardized.

DISCUSSION.

DR. J. C. MASSON, Rochester: I regret that Dr. Charles Mayo is not here to discuss Dr. Collins' excellent paper because he has had an extensive opportunity of seeing a great many patients under treatment in some of the hospitals in the East where this method of treating burns is being used a great deal.

I have not had any personal experience in the treatment of cases of burns, but my attention has been drawn to some of them, and the end results impressed me with the value of this form of treatment. I saw one patient, a young girl who was severely burned from her clothes catching fire, who had been treated by this method. Wet dressings were used to clear up the surfaces; the child suffered terribly while being dressed. After the surfaces had become practically sterile, as shown by a bacteriologic count, and the sloughing material was removed, the paraffin dressing was applied, with great relief to all the patients on that floor of the hospital, and with marked comfort to the patient. In this case the paraffin was not used as early as is advised by the men who use it extensively. The child's wounds healed rapidly under it; in one or two places that were slow to heal skin grafts were applied and after the fourth or fifth day when the grafts showed evidence of taking, the paraffin dressing was put on over them. The dressing did not interfere with the growth of the transplants, and the child made a perfect recovery.

Another case was that of a young man who sustained an extensive traumatic injury with great loss of skin and subcutaneous tissue of the forearm. I skin-grafted him, putting on the ordinary paraffin mesh that is so useful in these cases and left it there for three days. I then put on, on top of that, the paraffin. The patient was up and around from the first, and in eight days he was able to put the arm in an ordinary coatsleeve. The graft took and healed within a short time.

I am satisfied that this paraffin method is a great improvement on the ordinary dressing in extensive superficial wounds. It has been used in a few cases from time to time where we have had sloughing

abdominal wounds, and these wounds have healed leaving a granulating area of about one-half or three-quarters of an inch over the length of the wound which then slowly covered with epithelium. Such small areas, when sterile, can be covered with this dressing and the patient may be up and around with very little extra dressing. The immense saving in dressing material is a point worthy of consideration, and the wounds heal more rapidly.

DR. COLLINS (closing): This method has been used quite extensively by some clinicians for the treatment of raw ulcerated surfaces of the leg, and with success, but I have not had any experience with it and therefore have omitted it from the paper.

This method of treatment is one of the most fascinating things I have had to deal with. It is particularly fascinating to watch one of these ulcerated surfaces heal over. There are many features of it that attract one's attention. For instance, areas which appear to be completely denuded of skin, which appear to be complete second or incomplete third degree burns, will occasionally have some isolated spot on the raw surface which presents a darkened area ⅛ to ¼ inch in diameter. At the next dressing instead of having a darkened area it will be pinkish. In the next twenty-four hours, when you do the dressing there is a whitish area in the center. The next time there is perhaps a definite island of skin. It grows and grows and the next thing you know that island of skin is joining with another similar island of skin. It is certainly fascinating to watch. In the edges of the burnt area the islands of skin are more prolific. They appear quicker and they grow faster; they coalesce with one another, and the skin forms more rapidly there. There is no question but that this method preserves these isolated islands of skin, whereas by the older methods many were pulled off and destroyed. In this respect the paraffin method is a more valuable form of treatment than the old.

ONE HUNDRED PER CENT RECOVERIES IN CEREBRO-SPINAL MENINGITIS.

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Thirteen cases only were treated by the methods here outlined, but in view of the high fatality of cerebro-spinal meningitis in Minnesota, this method, used in London, Canada, seems worth describing, since all cases recovered.

Every case was confirmed as due to Weichselbaum's coccus by bacteriological tests of the cerebro-spinal fluid, including microscopic and cultural.

In ten cases, autogenous vaccines were made.

The cases were of both sexes and all ages; some civilians, some soldiers; three in 1916; two in 1917; eight in 1918. The treatment was begun as soon as the cases were recognized; usually early; in some cases late; in one as late as two weeks after onset.

The outstanding features of the treatment followed were:

(a) **Immediate** lumbar puncture: for diagnosis; for relief of pressure; to secure autogenous vaccine.

(b) **Immediate** intra-spinal injection of Flexner's serum, **to the extent of not more than one-third the amount withdrawn.**

(c) **Immediate** injection of stock meningococcus vaccine, subcutaneously.

(d) **Daily repetition** of (a) for relief of pressure; and of (b) for treatment: combined with use of autogenous meningococcus vaccine as soon as prepared and thereafter at intervals of several days, as patient's condition might indicate.

With one hundred per cent recoveries, we did not dare to omit any item of this procedure; but three cases treated similarly by Major George C. Hale of London, Canada, except that the vaccine was wholly omitted, also recovered. We had already suspected that the **repeated** tapping, and **frequent** use of **small** doses of Flexner's serum, were the **important** features. Nevertheless, some cases at least reacted vigorously to the vaccine and improvement seemed to date sharply from such reaction.

This combined method was introduced into London, Ontario, in April 1916 by Dr. Edward Fidlar, then Chief of the Division of Pathology of the Institute of Public Health. After he went overseas as Captain in the R. A. M. C., his work was continued by Dr. F. W. Luney, now Chief of the same Division, to whom I am indebted for the following notes, including a detailed account of three of the cases.

Meningococcus Cerebro-Spinal Meningitis in London, Can., *by*

Dr. F. W. Luney, Chief Div. of Pathology; Inst. of Public Health, London Ont.

Symptoms—symptoms most frequently noted were headache, vomiting, herpes, Kernig's, strabismus, and rigidity of the neck, often not very marked, and never approaching a true opisthotonos

Spinal Puncture—patient was placed lying on the side at the edge of the bed in the knee-chest position. Skin was cleaned with alcohol; needle was inserted in the middle line between two lumbar spines nearest opposite the crest of the ilium.

Withdrawal of fluid—in the very severe cases the patient was tapped twice daily; other cases once in 24 hrs. At each tap sufficient fluid was removed to lower the pressure to such an extent as to get a flow of not more than 4 or 5 drops a minute (30 to 75 c. c.).

Indications that tapping is no longer necessary:

(a) clear fluid
(b) negative cultures of C. S.F.
(c) normal pressure.

Administration of serum—In very severe cases give intravenously (10 to 20 c. c.), intramuscularly (10 c. c.), and intraspinously. Can be given by all three routes at one sitting. The amount given intraspinally depends upon the amount of cerebro-spinal fluid withdrawn. It has been our rule not to give more than one-third of the amount of C. S. F. removed. We believe that the production of a negative intraspinal pressure does much to aid in draining the upper portions of the canal and thus facilitates also secretion of the spinal fluid.

Foot of the bed—We raise the foot of the bed after each intraspinal injection for the period of one hour in the hope that gravity may assist the serum in seeking a higher level.

Vaccine treatment—Autogenous vaccines seem to be of some value in certain cases. As soon as bacteriological diagnosis has been made, stock vaccine up to 500 million per c. c. depending upon circumstances (age, sex, severity of infection, etc.) is given.

Autogenous vaccine is immediately prepared and can be ready for use in 24 hours. We have commenced with a dose of about 100 million per c. c. and have gradually increased the dose at weekly or sometimes biweekly intervals until recovery. Three or four injections are usually all that are necessary. We have had two cases here in the past year (Norman Axford and Leonard Blackwell), who developed rather severe reactions following injections. These reactions consisted of an exacerbation of the symptoms with increased respiration and pulse rate and a condition that closely resembled convulsions. Immediately following these reactions, marked and continued improvement was noticeable.

Indications for re-tapping—

(a) Occurrence of headache; (b) vomiting.

Usually these conditions are found to be due not to a relapse but simply to increased intracranial pressure.

Diet—Any nourishing food as long as it does not excite vomiting.

Other medications—

(a) Simple laxatives
(b) Keep mouth clean
(c) Vaseline for herpes.

PROTOCOLS.

Patient—Leonard Blackwell.
Physician—Dr. Nelson George.

The child, who was 12 years of age, had not been well since the middle of October, complaining of irregular attacks of headache, convulsions, and occasional vomiting spells with some indefinite abdominal pain. He was seen by his physician who made a tentative diagnosis of tuberculous meningitis. As the child's condition gradually became worse he was sent to the hospital, being admitted on Nov. 1, 1918.

Nov. 1, 1917—

Complains of headache and a cold feeling in the abdomen.

Nov. 2, 1917—

Headache more severe, took very little nourishment, and appears very weak.

Nov. 3, 1917—

Pain in head severe and extended to the back of the neck; the child has periods of unconsciousness and at intervals screams, some attacks lasting five minutes; during such attacks the muscles are rigid and the eyes are rolled back. Urination involuntary; leucocytic count—31,800 per c. m. m.

Nov. 4, 1917—

Although the headache does not seem so severe, the child is lying for a large portion of the time in semi-comatose state and is very weak. Dr. Hill was called in consultation and suggested a spinal puncture.

Removed 40 c. c. of turbid C. S. F. under marked pressure. Smears showed a few intracellular diplococci and cultures, a few colonies of Gram negative diplococci.

Gave 10 c. c. of antimeningitis serum.

Raised the foot of the bed for one hour.

Nov. 5, 1917—

Condition appears the same; a herpes labialis has developed; there is a slight palsy of the external rectus of the right eye.

Removed 40 c. c. of C. S. F., turbid and under pressure.

Cultures show a Gram negative diplococcus.

Gave 10 c. c. of antimeningitis serum (anesthetic used) and raised foot of bed.

Nov. 6, 1917--

No improvement in condition, the child is in a state of semiconsciousness, urinates and defecates involuntarily, takes no nourishment and screams at intervals. Squint still present.

Removed 20 c. c. of turbid fluid, under pressure. Cultures negative.

Gave 10 c. c. of antimeningitis serum (anesthetic used) and raised foot of bed.

Gave 100 million of autogenous vaccine.

Nov. 7, 1917—

The patient's condition seems unchanged; there seems to have been no reaction to the vaccine other than an increased pulse rate, and a period of vomiting.

Removed 40 c. c. of slightly turbid fluid under pressure.

Gave 10 c. c. of antimeningitis serum (anesthetic used) and raised foot of bed.

Nov. 8, 1917—

Condition about the same, appears at times to be a little brighter but lapses into periods of unconsciousness. Has still involuntary discharges, has pain in head which, however, is not quite so severe. Had an attack of vomiting without nausea and still has a slight external squint.

Removed 40 c. c. of C. S. F., turbid and under pressure.

Gave 10 c. c. of antimeningitis serum (anesthetic used); raised foot of bed.

Nov. 9, 1917—

The child's general condition appears slightly improved.

Removed 40 c. c. of blood-stained C. S. F. under pressure; cultures negative.

Gave 10 c. c. of antimeningitis serum (anesthetic used); raised foot of bed.

Gave 200 million autogenous vaccine.

Nov. 10, 1917—

The general condition is much improved; he has had periods of sleep, took considerable nourishment, is conscious and appears quite bright. He still has headache, however, and has shown no definite reaction to vaccine.

Removed 40 c. c. of spinal fluid; clearing and under pressure.

Gave 10 c. c. of antimenjngitis serum (anesthetic used); and foot of bed raised.

Nov. 11, 1917—

The patient has had considerable headache today and pain in the back of the neck; had two or three attacks of vomiting which were not associated with nausea. Following intraspinal treatment, complained of severe pain in the back and lower extremities.

Removed 40 c. c. of C. S. F.; clearing and under pressure.

Gave 10 c. c. of antimeningitis serum (anesthetic used); raised foot of bed.

Nov. 12, 1917—

The condition seems very good today, complaining only of but slight pain; the palsy is the right eye has disappeared.

Did not remove C. S. F. or administer serum.

Nov. 13, 1917—

Complains of but little pain, seems stronger but has developed a diffuse punctate rash over the whole body which is very itchy.

Removed 10 c. c. of C. S. F.; quite clear, but yellow, no fibrin settles out on standing, (anesthetic used).

Gave no serum.

Nov. 14, 1917—

Condition about the same; rash still persists and is very itchy.

Removed 40 c. c. of clear fluid, slightly yellow; no fibrin settled out.

Gave 8 c. c. of antimeningitis serum (anesthetic used); and foot of bed raised.

Gave 300 million autogenous vaccine.

Nov. 15, 1917—

Following the vaccine injection of the previous day the child developed a marked reaction which for a time was really alarming. In the morning the temperature went up to 102, the pulse which had been averaging 94 leaped up to 104, the pain in the head and back of the neck was quite severe, he had pain across the abdomen, vomiting his breakfast, and early in the afternoon had successive convulsive seizures lasting for 20 minutes. Later in the day the general condition improved; the rash has nearly disappeared. At 10:30 p. m. the above symptoms reappeared and lasted on and off for about an hour. The attending physician gave up all hope.

Removed 40 c. c. of C. S. F. under marked pressure but becoming quite clear.

Gave 8 c. c. of antimeningitis serum (anesthetic).

Nov. 16, 1917—

The rash has disappeared; during the early morning the child had severe convulsions but later in the day although restless, the pulse is of better quality and he obtained some sleep.

Removed 40 c. c. of clear spinal fluid under marked pressure (anesthetic used).

Gave no serum.

Nov. 17, 1917—

Condition seems much better, has slight pain in the back and head but appears quite bright; vomited; discharges still involuntary.

Removed 40 c. c. of clear C. S. F. under pressure.

Nov. 18, 1917—

Condition much improved, no pain, took nourishment well, sleeps well, and has again control of bladder and rectal sphincters.

Nov. 19, 1917—

No complaints, appetite good, etc.

Nov. 20, 21, 22, 1917—

Continually improving.

Nov. 23, 1917—
Smears from nose and throat, negative.
Nov. 24, 1917—
Smears from nose and throat, negative.
Nov. 25, 1917—
Smears from nose and throat, negative.
Dec. 3, 1917—
Discharged.

Subsequent history—
Good.

Summary—
13 spinal punctures.
Total C. S. F. removed, 480 c. c.; average per day, 37.
Total amount of serum given, 106 c. c.
3 vaccine treatments.
No sequellae.

Patient—Norman Axford.
Physician—Dr. Schram.

The boy who was 10 years of age, developed while at school on the afternoon of January 30th. chills which lasted for two hours. He was sent home and his mother put him to bed where he developed further chills, tenderness and stiffness in the back of the neck and headache and a couple of attacks of slight vomiting.

He slept well that night and appeared quite rational but was still sick and vomiting several times. He had developed a herpes labialis. About 12:30 he again vomited and the family thought it wise to call in a physician who left some tablets but made no diagnosis. At 7 p. m. he was quite irrational and did not recognize his father; the parents were alarmed and again called the physician. At this time the temperature was 101.5, pulse 100, and respiration 32. Physical examination showed a positive Kernig's, a left lateral nystagmus, a condition approaching opisthotonos and delirium. The child's condition became worse and the physician asked for a consultation and Dr. Macgregor was called in. The child in his delirium was very excited and it was found necessary to give him hyoscine before an examination could be made. Examination of the eye revealed a neuro-retinitis; a diagnosis of cerebro-spinal meningitis was made and he was sent to the hospital early in the morning of February 1st, with a hopeless prognosis and with the probability that the child could not live more than three days.

Feb. 1, 1918—
On admission was very restless, screaming out continually and delirious; temperature 99° to 100°.
50 c. c. of turbid fluid under pressure was removed.
Gave 16 c. c. antimeningitis serum.

Feb. 2, 1918.
Condition unchanged, has practically slept none during the past 24 hours—temperature 99 to 101°.
Removed 40 c. c. of turbid fluid under pressure.
Gave 10 c. c. of antimeningitis serum.
Gave 500 million meningococcic stock vaccine.

Feb. 3, 1918—
Condition practically unchanged, marked restlessness has resulted in erosions of the knees and elbows which had to be padded. The bed was also padded.
Removed 25 c. c. of turbid fluid.
Gave 10 c. c. of antimeningitis serum.

Feb. 4, 1918—
Patient much quieter, is conscious and takes food very well.
Removed 12 c. c. of fluid (more would not drain), becoming clear.
Gave 5 c. c. of antimeningitis serum.

Feb. 5, 1918—
Has been restless again today.
Removed 10 c. c. of fluid (clearing).
Gave 4 c. c. of antimeningitis serum.
200 million autogenous vaccine.

Feb. 6, 1918—
During the night the pulse and respiration went up to 100 and 26 respectively and he had a series of muscular contractures resembling convulsions (possibly due to vaccine).
Removed 15 c. c. of clear fluid under normal pressure.
Gave 10 c. c. of antimeningitis serum.

Feb. 7, 1918—
Seemed to be in fine condition, lying on his back and appears comfortable. Temperature down to 99.—and did not tap.

Feb. 8, 1918—
Condition appears good.
Removed under slightly increased pressure 17 c. c. of clear fluid containing flakes of fibrin.

Feb. 9, 1918—
Condition good, complains occasionally of slight headache.
No puncture.

Feb. 10, 1918—
Complains of slight headache but otherwise O. K., removed 25 c. c. of clear fluid under pressure.
Gave 6 c. c. of antimeningitis serum.

Feb. 11, 1918—
Complains of severe headache and pain in back of neck.
Removed 50 c. c. of clear fluid under pressure.
Gave 8 c. c. of antimeningitis serum.
Gave 250 million autogenous vaccine.

Feb. 12, 1918.
Still complains of headache and pain in the back of the neck.
Removed 40 c. c. of clear fluid under pressure.
No serum.

Feb. 13, 1918—
Headache clearing up.
Removed 30 c. c. of clear fluid under slight pressure.
Gave 200 million autogenous vaccine.

Feb. 14, 1918—
Condition good, has developed a serum uticaria.
Did not puncture.

Feb. 15, 1918—
Condition improving, only occasional slight headache.
No puncture.

Feb. 17, 1918—
Vomited breakfast, complains of headache.
Removed 15 c. c. of clear fluid.
Gave 300,000,000 autogenous vaccine.

Feb. 18, 1918—
From this date on continued to improve and was able to go home on Feb. 28 after having three negative cultures from nose and throat.

Summary—
12 spinal punctures.
Total C. S. F. removed, 329 c. c.; average per tap, 28.
Total amount of serum given, 69 c. c.
4 vaccine treatments.
No sequelae (after 6 months).

Patient, Pvt. J. P. Stewart, W. O. R., No. 3131497.
Physician, Major Smith, A. M. C.

The patient who was 29 years of age had been in the service but two weeks. He said that since the time he was drafted he had suffered with a very severe cold in the head and chest, which however, had begun to get better. On February 8, in the afternoon, he went down town to the soldiers' club, spent the afternoon there and apparently was in good health; on the way back to the W. O. R. quarters, however, at Queens Park, he remarked that he had a sense of numbness in his feet, felt unusually thirsty and had slight headache. The headache, which was temporal in character became rapidly worse; that night he vomited, developed pain in the neck and became unconscious. Capt. Moore, A. M. C. examined the patient and found rigidity of the neck, a definite Kernig's sign, a temperature of 101° but there was no rash, and no palsies of the eye muscles. As a meningitis suspect he was at once transferred to the quarantine lines at Wolseley barracks.

Feb. 9, 1918—
When seen on the morning of this date, the patient was unconscious and passed involuntarily faeces and urine in the bed. Spinal puncture was performed.
Removed 50 c. c. of turbid fluid under marked pressure.
Gave 10 c. c. antimeningitis serum intraspinally.
Gave 10 c. c. antimeningitis serum intravenously.
Smears from the nose and throat, suspicious.
Examination of C. S. F. showed—
cell count—abundance of pus
globulin—increased
bacteriologic—few colonies of Gram negative cocci.

Feb. 10, 1918—The patient's general condition is somewhat better, he has periods of consciousness but complains of considerable pain in the head and neck.
Removed 60 c. c. turbid fluid under pressure.
Gave 20 c. c. of antimeningitis serum intraspinously.
Gave 100 million of stock vaccine.
Smears and cultures of spinal fluid show Gram negative diplococci

Feb. 11, 1918—
The patient's condition is much improved, is quite conscious and complains of nothing but headache and rigidity in the neck. He has had no strabismus. The vaccine produced no reaction.
Removed 16 c. c. of fluid which is under normal pressure and clearing.
Gave 8 c. c. of antimeningitis serum intraspinously.

Feb. 12, 1918—
Patient's condition improving.
Removed 15 c. c. of slightly turbid fluid under normal pressure.
Gave 8 c. c. of antimeningitis serum.

Feb. 13, 1918—
Condition improving, complaining only of slight headache.
Removed 20 c. c. of C. S. F. which is becoming quite clear.
No serum given because of pain (shooting into legs).

Feb. 14, 1918—
Condition good.
Removed 10 c. c. of C. S. F. (low pressure).
Gave 250 million autogenous vaccine.

Feb. 15, 1918—
Removed 30 c. c. of clear C. S. F.

Feb. 17, 1918—
Complained of nothing, has good appetite, etc.
Gave 300 million autogenous vaccine.

Feb. 23, 1918—
Release smears from nose and throat—negative.

Feb. 28, 1918—
Release smears from nose and throat—negative.

Mar. 2, 1918—
Release smears from nose and throat—suspicious.

Mar. 7, 1918—
Release smears from nose and throat.

March—
Discharged.

Subsequent history—
Good.

Summary—
7 spinal punctures.
Total amount C. S. F. removed—200 c. c. average per day—29 c. c.
Total amount of serum given—56 c. c.
3 vaccine treatments.
No sequellae.

THE ELECTROCARDIOGRAPH IN THE DIAGNOSIS OF HEART DISEASES.*

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At present, a diagnosis of "irregular pulse" is as incomplete as one of "heart murmur". It merely opens the way to a knowledge of the nature and origin of the irregularity. The determination of these facts is even more important in prognosis and treatment than the localization of a valve murmur.

While it is not practicable at the present time to reduce each patient's pulse to a permanent black-and-white record, the doctor should become familiar enough with the physiological events represented by these records to visualize them to himself when he examines the patient.

Gaskell in 1882 classified the attributes of the heart muscles as follows:

1. Rhythmicity—the faculty of rhythmically initiating an impulse.

2. Irritability or Excitability—the capacity for receiving a stimulus.

3. Contractility—the faculty for responding to a stimulus.

4. Conductivity—the ability to convey a stimulus.

5. Tonicity—the power to maintain cardiac tone.

The first four have distinct varieties of arrhythmias corresponding to them, demonstrable in electrocardiograms. Disturbances of the fifth, tonicity, is exemplified by cardiac dilatation and is outside of the scope of this paper.

1. Disturbances of rhythmicity of the heart muscle is due to either increased sensitiveness of the sinus region of the heart, which is known as the pace maker, or to increased irritability of the vagus nerve which, under conditions of emotion, youth or toxicity, will respond to reflex impulses which are usually too slight to cause stimulation.

This type of arrhythmia is called physiological, sinus, vagus, neurogenic or respiratory arrhythmia and, except when associated with Cheyne-Stokes respiration or with signs of cardiac failure, has no serious significance. It may be so extreme as to make diagnosis doubtful without a graphic tracing, though usually the wave-like rise and fall of rate with respiration, the transient character and its abolition by atropin, will reveal its nature and reassure the fears of the patient or the nurse who has discovered an irregular heart.

2. In extrasystolic arrhythmia the excitability of the heart muscle in abnormal sites is evidenced, though the normal sinus rhythm is maintained for the most part. A premature contraction may arise in the wall of either ventricle or auricle, and is felt at the pulse as a missed beat or as a small beat followed by a pause longer than the usual pause between pulsations. The systolic contraction is heard over the heart, corresponding to the abnormal beat at the radial, and the compensatory pause may be noted. Premature contractions may occur over a considerable period of time, alternating quite regularly with the normal beats.

3. Abnormal contractility is shown in the rare cases of true alternating pulse and in the numerous cases of arrhythmia known as auricular fibrillation.

After reading an electrocardiogram of this type with the extremely rapid and incoordinate fibrillations of the auricle, the cause of the irregularity is seen at once. If a patient shows a decompensated heart with a rapid and irregular heart rate of 120 or over, a diagnosis of fibrillation must be made. An electrocardiogram would show innumerable small contractions of the auricle, only a few being effectual in causing ventricular contraction. Many of these are so small as to cause no pulse wave. The radial rate may be only 80, while the stethoscope gives 120, with a pulse deficit of 40.

Under therapy the heart becomes slower and steadier and the pulse deficit less until both apex and radial rate may be 70 or less. If the patient is seen at this stage for the first time, the doctor may be at a loss to diagnose the arrhythmia unless he has clearly in mind the events taking place in the heart muscle and recognizes that no two beats and no two intervals are alike and that there is no dominant rhythm.

4. Abnormal conductivity is shown in heart block, partial and complete, in which the bundle of His fails to transmit impulses. The

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ventricle may beat independently of the auricle or may respond to only every second or third auricular beat, giving a 2 to 1 or 3 to 1 heart block.

In complete block the ventricular rate is very slow (35 or less) and the jugular pulsations are more frequent, showing the more rapid auricular rate. In partial block there may be omission of beats or a sudden halving of rate. If a beat is dropped at the radial and no systolic tone is heard at the apex corresponding to it, the probable explanation is that the auricular contraction has taken place, but the impulse has been blocked before causing a ventricular systole. Not infrequently the auricular contraction can be heard as a faint but distinct tone.

The electrocardiogram gives indirect, suggestive and corroborative evidence about hypertrophy, drop heart and some of the valvular lesions, and very definite records of the arrhythmias and of digitalis effect.

The time may come when each patient can have his arrhythmia diagnosticated and his therapy controlled by the electrocardiograph. But today the doctor can best make use of this means of diagnosis by becoming familiar with the events which take place in the heart as shown by the electrocardiograph so that he will recognize the common arrhythmias, secure graphic records of the difficult ones and interpret his clinical findings in the light of the knowledge he has obtained from the study of graphic tracings.

DISCUSSION.

DR. H. L. ULRICH, Minneapolis: I want to reiterate what Dr. Hansen has said in regard to the value and importance of the electrocardiograph. Nothing in cardiac pathology within the last ten years has been so great as the contribution of the electrocardiograph to our knowledge of the function of the heart.

Some of you probably heard what Sir James Mackenzie said in Chicago at the meeting of the American Medical Association. I heard him discuss "effort syndrome" in which he brought out conclusively the fact that he was sorry the stethoscope had ever been invented, meaning by that we have been paying too much attention to the morphology of the heart and not enough to its function. The functional clinical value offered by this instrument, the electrocardiograph, cannot be appreciated too highly. Prior to the discovery of the electrocardiograph we had no conception whatever of what auricular fibrillation meant, yet that is one of the most common defects of the heart. We had no conception of paroxysmal tachycardia, which Dr. Hansen shows up—to be auricular flutter. These two conceptions in cardiac pathology have been tremendous contributions to our clinical assets. After contact with one of these machines, our clinical ideas at the bedside, including physical examination of the heart, are much more intensive.

In the study of the treatment of heart disease, and particularly in the use of digitalis, this instrument is of value. Twelve hours before our clinical methods, this instrument can show us the effect of digitalis, whether salutary or not.

The electrocardiograph has been a valuable contribution to heart disease in our city as it has been to other cities in which the instrument is used. Dr. Morris of the University has hoped to hitch up his heart station with the doctors' offices by means of the telephone wires. If this plan had failed he had been considering a portable type of electrocardiograph. The war, of course, has stopped all these experiments.

I urge you all to become acquainted with this instrument when the opportunity presents. The matter is not so deep and so intricate as the curves exhibited by Dr. Hansen suggest. It is a simple instrument if one understands the fundamental features which are really the physiology of the heart interpreted in graphic form.

DR. HANSEN (closing): One should not expect miracles from the use of the electrocardiograph. It does not give definite information above valve murmurs. Occasionally a doctor will ask whether this instrument will give more definite information of a valve lesion than the stethoscope. The information it gives about a valve lesion is limited, but as regards the function of the heart it will give you more information than anything else.

IRITIS.*

J. H. JAMES, M. D., F. A. C. S.,
Mankato, Minn.

While there is a scarcity of new facts concerning this disease there are some old ones that we need to reiterate lest we forget, and this is my only excuse for presenting this paper. One of these reiterations is, that there are too many mistakes made in the diagnosis of this disease and we therefore need to have our mind refreshed occasionally in order that a lasting impression may be made and the sad consequences to us and our patients may be less frequent.

*Read before the Southwestern Minnesota Medical Society, May 9, 1918.

It is a serious matter when, from error of diagnosis and of treatment our patients lose an eye. Authors describe inflammation of the iris under several heads, such as Acute, Congenital, Acquired, Idiopathic, and Traumatic; Primary, Secondary, Simple or Complicated.

The acute attacks come on like a simple conjunctivitis and for this it is often mistaken. The symptoms begin with discomfort or pain in the eye, and this soon spreads to the brow and down on to the cheek, gradually becoming worse and is especially worse at night.

There is redness of the ocular vessels, particularly those adjacent to the corneal border. This redness begins as a pink color which might easily be taken for "pink eye," but it soon becomes of a darker hue. By this time the eyeball has become tender to the touch and as the inflammation becomes fully developed the globe becomes exceedingly sensitive, lachrymation and photophobia supervene; there also begins a discoloration of the iris which takes on a muddy appearance, the corner loses its lustre, and the pupil becomes contracted and responds feebly, if at all, to light or accommodation.

About this time an exudate begins to appear at the pupillary border which is glue-like in consistency and this forms adhesions with the iris and lens capsule with which it is in contact. If these adhesions are not discovered promptly they form synechia, the pupil becoming bound down and attached at its border often causing occlusion and blindness. This comes on so insidiously as to be often beyond remedy before we are fully aware of it, and when the attachments are in spots, it results in an irregular dilatation of the pupil whenever it responds under treatment to a mydriatic. In the earlier stages these adhesions can be prevented and sometimes they may be broken up —when they have recently formed—by the prompt and persistent use of an effective mydriatic; but when they have occurred, they often leave a spot of brown pigment where the attachments have been on the lense capsule and these spots rarely ever disappear. They remain as small black specks before the eye ever afterwards. There is always more or less lowering of vision in iritis, owing to the cloudiness of the aqueous humor, to deposits on the lens capsule or on the inner layer of the cornea, or from exudate in the pupillary space or the vitreous. The accommodation is interfered with and may be one of the causes of dimness of vision. Occasionally we meet with cases in which pain and redness are either absent, or so slight as to pass practically unnoticed, and in such, the impairment of sight may be the only symptom complained of.

Impairment of sight should always make us suspicious, for when we find this symptom, something is radically wrong. This form is so insidious that the patient is hardly aware that there is anything the matter until he notices that vision has failed.

As to the pathology of iritis, we find that there is enlargement of the blood vessels of the iris both in length, breadth and calibre.

The endothelium is displaced by fibrinous exudate which penetrates the iris like a sponge and overflows into the anterior chamber and pupil.

There is increased leucocytosis and in some cases hemorrhage, especially in septic iritis.

Etiologists have hitherto conceded that fifty per cent. of cases of iritis are due to syphilis, and that the attacks occur in both congenital and acquired syphilis. This statement however, is now being seriously questioned by many who believe that it has been exaggerated, holding that it is rarely a primary cause, but, that by destroying the bodily resistance may thereby act as a contributing or concomitant cause. At the recent meeting of the Southern Medical Association, Dr. John Green, Jr., is reported as saying, "We are getting away from the idea that syphilis is responsible for all the cases of iritis. We used to be surprised, if we found a case in which syphilis was not the true etiology. Every source of focal infection should be investigated."

Dr. Eu Laney Madson also said, "Syphilis is rarely a direct cause of iritis, it is a more of a predisposing cause, a condition that lowers the vitality and makes the individual more susceptible to the infection."

So we are beginning to see that focal infection is now taking the lead as an etiological factor in producing iritis.

There are other etiological factors given such as gonorrhoeal rheumatism, pyorrhoea alveolaris, dyspepsia, and acid diathesis.

The latter should in my opinion be classified with rheumatism for I believe true rheumatism *per se* is always an acid diathesis and that they are one and the same thing. There is no other disease which has the unequivocal, absolute pathognomonic symptoms that accompany rheumatic fever, and therefore I claim that most of the so-called rheumatism is not rheumatism at all. For instance, gonorrhoeal rheumatism is not rheumatism, for no one will dispute its bacterial or infectious origin.

Iritis I am inclined to believe is almost always due to infection. It is almost never seen in rheumatic fever nor during convalescence from the disease, and for this reason I believe it is never the cause of iritis.

That bacterial infection may and does cause iritis I do not question, but I have yet to be convinced that inflammatory rheumatism is ever a cause of the disease. There has always been some element of doubt concerning rheumatism as an etiological factor, notwithstanding the fact that our text books taught it, and this skepticism has become more prominent today than ever before. Dr. Jackson of Denver reports only one case seen in his long practice in which he could attribute rheumatism as a cause. It is undoubtedly true that many cases of iritis are associated with subacute articular maladies, which are supposed to be of rheumatic origin, but according to modern views, I understand that these cases are associated with chronic septic infection, often oral in origin, and in many cases "these varieties of iritis and iridocyclitis which have been classed as 'rheumatic,' are now classed as toxic, in order to conform to improved etiology." These forms of iritis are as a rule accompanied by severe pain, but cases may be of the quiet kind and repeated attacks are apt to occur, and, as opposed to syphilis may be confined to one eye.

My own belief is that uncorrected refractive errors and heterophories are predisposing and concomitant causes of some of the iritic and other ocular affections although I do not find these so classed in ocular etiological or other literature.

The constant compromising adjustments that have to be made by the ciliary and extrinsic muscles of the eyes in the attempt to focus and to see clearly in eyes so afflicted, I can readily imagine might lead to disarrangement and affection of these delicate structures and thus to pathological metabolism and inflammation. This is particularly true if there happened to be a focal infection anywhere in the system. It would then be liable to manifest itself through the bacilli or toxines attacking overworked, weakened and depleted organs or tissues. This inference seems to me to be a reasonable one notwithstanding the fact that it seems to have been overlooked or ignored as unworthy of mention so far as my investigations have led me to discover in ocular literature.

I shall not enlarge on the varieties of iritis, such as the serous, diagnosed by the formation of dust-like looking deposits on the inner layer of the cornea, and seen only with the high powers of the ophthalmoscope, with cloudy vitreous and pupillary adhesions, or diabetic iritis —a rare form—but will say that toxemic iritis has an undoubted entity and probably belongs to a fair proportion of the so-called idiopathic, as suggested by a late writer in the Encyclopedia of Ophthalmology.

Among five hundred cases reported and observed in the "Wills Eye Hospital" in 1899, syphilis was given as the cause in three hundred and seven cases. Rheumatism came next in order, one hundred and twenty-seven cases; gonorrhoea, twenty-six cases; influenza, seven; but other than as above, sepsis was not mentioned. Irons and Brown record one hundred cases, giving syphilis as a cause in twenty-three; gonorrhoea, nine; tuberculosis, eight; and other infections, thirty-eight.

As to the diagnosis, iritis is frequently mistaken for acute catarrhal conjunctivitis, however, a careful attention to the following points will generally clear up the diagnosis. Conjunctivitis presents a discharge, uncomplicated iritis never. In conjunctivitis the greatest redness is situated posteriorly, while in iritis it is more prominent just around the corneal border. The redness in conjunctivitis is more superficial and the vessels when pressed upon may be made to disappear, while in iritis the deeper vessels are injected and when pressed upon do not so readily disappear as do the more superficial vessels in conjunctivitis.

The iris in conjunctivitis will respond to light and accommodation while in iritis, if it responds at all, it will do so sluggishly and is often contracted and immobile. Vision is not

diminshed in conjunctivitis, barring the spreading of mucus over the surface of the cornea, or if complicated with keratitis. In iritis vision is reduced, and the color of the iris is changed, while in conjunctivitis the iris is not changed in either color or its lustre. In conjunctivitis the pupil dilates readily under a mydriatic while in iritis if it dilates at all it will be slow and sluggish and perhaps irregular.

Acute inflammatory glaucoma may be mistaken for iritis but if so and treated as iritis the result in all probability would be disastrous.

The following points noted should prevent such a mistake. In iritis as previously stated the pupil will be small, in glaucoma the pupil will be dilated. In iritis the patient will probably be under forty-five years of age, while in glaucoma the probabilities are that he will be past middle life. In iritis the tension of the eyeball will be augmented at the height of the inflammation but in glaucoma it will be increased intermittently or permanently.

The anterior chamber in iritis is normal while in glaucoma it will be shallow; the cornea in iritis will be sensitive in glaucoma it will be anesthetic, and acute glaucoma is ushered in with vomiting.

In the treatment of iritis there are three important considerations to be observed; first, to keep the pupil fully dilated, so long as the inflammation continues; second, to search out diligently the cause and if possible remove it, and the third, to relieve the pain.

From the beginning to the end of the inflammation it is absolutely necessary to secure complete dilatation of the pupil and to keep it thus in order to prevent synechia and to break up any that have formed if it is possible to do so. For this purpose sulphate of atropia should be used in sufficient strength to accomplish the purpose. It is used in one per cent. solution, one or two drops in the eye every two hours until the pupil becomes fully dilated, and used sufficiently thereafter to keep the pupil at its maximum dilatation. A one per cent solution of cocaine is often used in conjunction which is said to augment the mydriatic power of the atropine and a five per cent. solution of dionin dropped into the inflamed eye every five minutes for a few times will produce a lymphagogic action and help to absorb adhesions and to relieve the pain.

The atropine puts the ciliary body and iris at rest, prevents the dangerous adhesions and relieves the congested vessels. It may be found that the strength of the atropine solution has only a partial effect on the pupil in which case it may be made stronger. At the same time the patient should be watched to see that no constitutional effects occur therefrom. I have sometimes been obliged to use the atropine in powdered form before satisfactory results could be obtained. Hot applications as hot as can be borne should be applied either dry or wet, against which an electric bulb lamp may be held for twenty minutes or half an hour three or four times a day. When the pain is great, blistering of the temple, or blood-letting by means or an artificial or a live leech, if obtainable often gives great relief from the pain at night. Aspirin has been recommended in ten grains and even in greater doses, and even morphia may sometimes have to be resorted to in order to give relief from the pain and sleeplessness. Always begin the treatment by evacuating the bowels by a dose of calomel followed by a saline cathartic.

General treatment should be instituted in accordance with the etiology discovered; the nose, throat and teeth should be carefully examined, and if possible an X-ray picture taken to ascertain if there be any concealed foci of infection present; if found they should be removed. One of our local physicians about three years ago had a violent attack of iritis in one eye which was persistent, exacerbations returning from time to time with vicious adhesions occurring within a few hours after each recurrence and for which no cause could be determined. It was supposed to be of rheumatic origin until finally the dentist discovered a small sinus alongside of a tooth which led to a root abscess. When the tooth was removed the iritis got well and remained well. Vaccine treatment has been successfully reported in gonorrhoeal iritis and also in tubercular and the iritis of streptococcic origin. Anti-streptococcic polyvalent serum treatment, also the cyanide of mercury injected under the conjunctiva is said to give rapid and marked improvement in obstinate cases, but with these I have had no experience.

The great objection to constitutional remedies is their slowness of action, and we must therefore use remedies that can be relied on to act quickly and within a few hours.

The majority of patients who come to me suffering from iritis have diagnosed their own case as a simple conjunctivitis or pink eye and not getting well as they expected have either consulted their family physician or have come direct. By this time synechias have developed. If having consulted a physician the condition has not been fully recognized in the beginning, or if insufficient energetic measures have been employed so that the pupil is only partially dilated, permanent injury has occurred.

Therefore it is my wish to impress this fact, that iritis is often a very insidious disease in its beginning; it is often mistaken for a simple conjunctivitis or "pink eye," and therefore care should be always taken to make if possible an accurate diagnosis as set forth and to at once institute energetic protective measures to prevent disastrous effects of adhesions, for delay or mistaken judgment is dangerous.

THE RELATION OF LABYRINTH DISTURBANCES TO GENERAL SYMPTOMATOLOGY.*

HENRY A. BEAUDOUX, M. D.,
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Mr. President and Members of the Association:—The last decade has brought such a wealth of material and progress in the various fields of our profession that otology, no less than any of the other branches, claims for itself important and well crystalized advancement. For many years we were well aware that there existed an external, middle, and internal ear, the former two with demonstrable functions, but the latter, with the exception of its auditory function, remained more or less terra incognita. Otologists all over the world attempted from time to time to unravel many of the complex symptoms which seemed to find their origin in that isolated portion of the temporal bone known as the cochlea and vestibular portion of the inner ear. It remained for Barany to set a new line of thought concerning the different roles played by these two portions of the internal ear, and to demonstrate by careful experiment that they had entirely different functions. His experiments were quickly taken up by Neumann, Alexander, Ruttin, Randall, Fisher, Jones, and others who worked out more intimately the neuro-physiology through which these different phenomena took place. It was therefore satisfactorily demonstrated that the cochlea was concerned exclusively with the function of hearing, while the static portion, consisting of the utricle, saccule, and the canals were the chief organs of equilibration, and that disturbances of the static labyrinth manifested themselves by dizziness, staggering, nausea, vomiting, and sometimes diarrhea. It would be impossible in a paper of this length to deal minutely with all the tests which lead to the different conclusions concerning the prominent symptoms already mentioned, and with which we are all so often confronted in our daily practice. I must, therefore, refer you to such monograph as Ruttin's, Jones', and others for correct technique and interpretation.

The general practitioner is often confronted by nausea, vomiting, and dizziness, and it is to him more particularly that I wish to call attention to the possibilities of erring in diagnosis, though, as you may well imagine, the ophthalmologists, otologists, the syphilologists, the neurologists and general surgeons come in for their due warning concerning the same caution when they are dealing with similar symptoms.

Before giving the results of the ear tests which will clear for us, if well understood, the elimination of the ear or the differentiation between ear, eye, brain, constitutional or toxic, abdominal disturbances or lesions, it will be necessary to remember that the semicircular canals can be studied by the so-called turning movements in a purposely made revolving chair, second, by douching the ear with either hot or cold water, also that when the individual is turned in the revolving chair with the head in the upright position, the horizontal canals alone are stimulated, and when he is turned with the head forward or backward, the verticle canals are the ones that respond to the rotating movement, involving, of course, the labyrinth of both ears, while douching influences only one ear at a time and is preferable, since it enables

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the diagnostician to eliminate one side from the other. Douching the ear with the head in the upright position stimulates the verticle canals, whereas douching with the head either forward or backward, stimulates only the horizontal canal (contrary, as you notice, to the rotation test in the same position). The galvanic current or electric test concludes the list of artificial stimulation, furnishing information concerning the function of the static portion of the inner ear, but is considered less useful because, like the rotation test which stimulates both labyrinths, the electric current stimulates all portions of the internal ear including the eighth nerve itself.

In dealing with these tests I shall, therefore, only refer to the first two which are essentially sufficient to make a correct diagnosis, cautioning you, however, not to use the douching or caloric tests either with cold or hot water in cases where a preforation of the membrana tympanae is present. Quoting directly from Jones' report on these tests, he says, "You may see that the endolymph within the particular canal or canals stimulated is set in motion on the one hand mechanically by turning, and on the other hand thermically by douching. When a person is turned to the right, the endolymph catches up to the movement of the body; and when the turning-chair is stopped, the endolymph continues to move to the right by its own momentum. The physiology of the caloric test may be illustrated by the "thermosyphon" system of some of the popular automobiles. They have no water-pump to force a circulation through the radiator. The engine heats the water, decreasing its specific gravity and causin it to move upward and forward into the radiator where it is cooled, dropping to the bottom of the radiator, and continues downward and backward into the engine, thus completing the circuit. Similar, chilling the outer portion of a semicircular canal increases the density of the endolymph at this point and produces a circulation downward."

"Such ear stimulation produces certain definite phenomena in normal persons—a rhythmic jerking of the eyes known as nystagmus and a subjective sensation of turning which may be termed a systematized vertigo. The eyes are always drawn in the direction of the endolymph movement and are then quickly jerked back in the opposite direction by impulses from the cerebrum. The subjective sensation of vertigo is always in a direction opposite to the endolymph movement. According to our conviction there are only two reactions produced by ear stimulation—vertigo and nystagmus; it it because of this vertigo that the person fails in a definite direction, and also, when he attempts to find with his finger an object he has previously touched, he is unable to find it but past-points to the right or left, above or below, depending on the direction and plans of his sensation of vertigo."

"It is evident that if stimulation of the ear causes a movement of the eyes, there must be a definite nerve pathway from the ear to the cerebal cortex. The special object of our work has been the attempt to determine the pathways through the brain from the ear. On the basis of over 350 pathologic cases, including a considerable number of operations and necropsies, we have come to certain conclusions as to the course of the fibers from the ear through the brain-stem, cerebellum, and cerebrum. In brief, our conclusions are as follows:"

"The fibers from the horizontal semicircular canals pass through the eighth nerve to the brain-stem, and enter Deiterses nucleus in the medulla oblongata. At this nucleus the fibres divide, going on the one hand to the posterior longitudinal bundle, through which they are connected with the various eye muscles nuclei, to be distributed through the third, fourth and sixth nerves to the eye muscles themselves. It is this pathway that is responsible for the eye movement. The other pathway goes from Deiterses nucleus through the inferior cerebellar peduncle to the cerebellar nuclei of the same side, from which it proceeds through the right superior cerebellar peduncle to the decussation of the two superior cerebellar peduncles in the base of the cerebral crura; from this point there are two pathways to the cerebral cortex of both sides, but the main pathway goes to the cortex of the opposite side. The cortical centers that receive these fibres are postulated by Mills to be in the posterior portion of the second temporal convolutions adjacent to the cortical areas for hearing. It is this pathway from the horizontal canal to the cerebral cortex, passing through the cerebellum, that is responsible for the production of vertigo on ear stimulation.

The fibers from the verticle semicircular canals have a different pathway after entering the brain-stem, ascending in the pons to a point above the middle of the pons. At this point the fibers divide, on the one hand going to the posterior longitudinal bundle, to be distributed to the eye muscles; on the other hand the fibers enter the cerebellar nuclei through the middle cerebellar peduncle, from which point their pathway is the same as that of the fibers from the hozizontal canal. In a nutshell, by the vestibular apparatus we mean the static portions of the internal ears, and the pathways from the ears through the brain-stem, cerebellum and cerebrum."

In view of these facts, it is not overstating the case when we say that at best one could only guess as to the significance of such symptoms without the proper understanding of these tests, and that vertigo should no longer be regarded as a vague and general symptom. Biliousness, cardio-vascular vertigo, gastric vertigo, kidney vertigo and the other names so often found in our text books have no place in our ultimate analysis of cases and can have no meaning when it is remembered that vertigo cannot exist without disturbance or lesion of the vestibular apparatus. By these tests we have the means to analyze to a certainty whether the vertigo is due to an irritation, impairment, or destruction of some portion or portions of the ear or its associated pathways, and it will be very rare when a case accompanied by dizziness will remain obscure after the ear tests have been carefully made, just as a case suspected of nephritis or diabetis is readily cleared up by an examination of the urine or a positive Wassermann in a suspected case of syphilis. It will assist us to differentiate in a case of dizziness caused by toxemia, either evanescent or toxemia that have produced definite impairment of some portion of the inner ear or its pathway to the brain, labyrinthitis or other organic lesions in some parts of the vestibular tract, such as may be produced by a brain tumor, internal hydrocephalus, multiple sclerosis, tubercle, gumma, meningitis, etc., or in case the reactions are normal, we may be able to positively state that the vertigo is a purely functional one. Syphilis, which is such a common and prevalent affection, involving the central nervous system in the early incipiency of the disease, and particularly the eighth nerve, which seems especially vulnerable, is demonstrable by these tests, even though the Wassermann reaction may be repeatedly negative. A diagnosis of beginning involvement of the nervous system has been made several years before it could be detected by any other means. The progressive neurologist has not been dilatory in availing himself of the data furnished by these new tests in determining the causes of vertigo, function of the eighth nerve, labyrinth, eye-muscle palsies, spontaneous nystagmus, and the early diagnosis of syphilis. He has come to rely upon them in differential diagnosis between ear and intracranial lesions, for in many cases symptoms of internal ear disturbances simulate intracranial lesions and he has relied more of late years upon the ear test than the eye conditions, which he at one time looked upon usually as conclusive when present. It has ben my privilege to consult with eminent internists and surgeons, who after a most careful examination, could find nothing to account for sometimes slight and other times severe, but most annoying forms of vertigo, malaise, spasmodic nausea and vomiting and a general and continued indescribable "sinking spells" and to diagnose upon an analysis of the inner ear a disturbance of the equilibratory apparatus caused by either a repeated mechanical irritation of the already hypersensitive labyrinth, pathological findings in the middle ear, toxemia, either due to tobacco, alcohol or syphilis or circulatory disturbances even in the absence of actual demonstrable cardiac symptoms, except in suspected plethoric cases.

Chronic catarrhal condition with some accompanying deafness, retraction of the membrana tympani, atrophy, or tonic and clonic contractions of the tensor tympani muscle, furnish their share of such symptoms and it is in this particular class of cases that I would warn you against undue massage of Politzerization, particularly in the aged, for these patients often times suffer from arteriosclerosis and local pathological condition in the conductive apparatus of the middle ear, and much harm can be done and the disturbance of this sensitive organ without its normal compensation, giving rise to that which we all know as Meniere's symptom complex. Where deafness and tinitus accompanies the other symptoms, it is plain that

the attending physician will at once suspect some ear affection, but where this is absent one is not so apt to think of that organ as a causation factor, but when dizziness accompanies nausea and vomiting, one must at once suspect it or its intracranial pathways.

It should also be remembered that inner ear affections may be non-inflammatory and inflammatory, that the latter may need prompt interference, foreboding a grave prognosis, while the former, though accompanied by most annoying symptoms, such as deafness, vertigo, nausea and vomiting and staggering, do not as a rule endanger the patient's life and should in time be diagnosed and the patient relieved, even in cases of severe trauma, for concussion of the brain is in part concussion of the labyrinth and its pathways. These tests become important factors in traumatic cases where malingering or injury are to be detected and justice obtained where litigation is involved. Though a great deal has been written of late years concerning these new truths and that the experimentation may neurologically still be in its infancy, these are the pertinent facts which we as practitioners of medicine must constantly bear in mind in the presence of this poignant symptoms to which I have referred. I have not thought best owing to the newness and the rather difficult appreciation and understanding *a priori* of these tests, especially for those who have not given it particular attention, to deal with the fistula tests, which in itself means nothing more than some exposed portion of its vestibular apparatus in the middle ear (accidental drowning, sensitive labyrinth, perforation and fistula), nor the past-pointing test, which like the eye movements and the direction in which the patients fall during the different methods of stimulation and position of the different semicircular canals assist in the differentiation of the possible brain lesions which have been enumerated in the course of this paper. These do not really come within our sphere as otologists or general practitioners, but belong more properly to the neurologists who is especially fitting by his training and practice to draw better conclusions from the examinations made by otologists and ophthalmologists. What I have attempted to point out is that many cases that come under the observation of the general practitioner of medicine suffering from so-called slight strokes, sinking feeling, general malaise, without demonstrable organic lesions, temporary or persistent dizziness in young individuals or in the senile, either due to sclerosis or middle ear conditions and producing in many instances most unpleasant temporary or continued disturbances, should be classed first among the ear cases to which they properly belong.

Concerning the treatment of the functional neuroses it at once appears that every case must be considered by itself and treated accordingly to its individual diagnosis, the important factor, however, in the recovery is absolute quiet, rest in bed in the majority of cases, no matter what the diagnosis may be, for most of the time these patients are restless and have inclinations to do just the opposite of what their condition demands. If the case be caused by middle ear conditions, these, of course, must be corrected, if syphilitic, receive the proper treatment, if caused by brain tumor, proper localization and surgical interference determined, etc. Many of the lighter cases have come before us unrecognized and have been quickly relieved by a brisk carthartic and rest in bed for a few days, bromides and small doses of pilocarpine.

In conclusion let me say that where dizziness exists the ear must first be subjected to a rigid and careful analysis, for as I have pointed out to you, the ear alone is responsible for this symptom. The tests will show the ear to be either normal or abnormal, and, as Jones sums it up, "If the responses are normal we have narrowed the diagnosis down to (1) a purely functional neurosis, (2) ocular or vascular disturbance, (3) an evanescent toxemia, the source of which must be searched for. If abnormal, the test will help to locate the point of disturbance either within the ear itself or along its pathway within the brain." If we do this, such reported incredible errors as have been made and reported by members of our profession should rarely occur.

DISCUSSION.

DR. J. D. LEWIS, Minneapolis: Dr. Beaudoux has ably reviewed this new and interesting subject, leaving little to add that is likely to prove of practical interest to the general physician.

We are to understand that equilibration is not a function governed entirely by the static labyrinth, as the sense is a correlated one, presided over by the static labyrinth, eye muscle impulses and the kinetic sense as well. We know that when both labyrinths

have been destroyed, after a time the patient will regain normal equilibratory function, although his sense of orientation remains permanently impaired. To illustrate: One whose labyrinths are dead is able to swim upon the surface of the water as does a normal person, yet when beneath the surface of the water his sense of position is lost, for which reason, it is dangerous for him to venture under water, or attempt to fly in an aeroplane, for if plunged into a cloud bank, he would lose control of the machine, owing to his loss of space sense.

The importance of the caloric and past-pointing tests, worked out by Barany, is indicated by the fact that it brought to him the Nobel prize in 1915.

To show the practical application of the several labyrinth tests,—a person who past-points before turning, or fails to past-point after being turned, has some disturbance, either of the internal ear or along the pathways from the ear to the brain centers, or a supraneuclear lesion; therefore, we are able, by known stimuli applied to the labyrinth, to determine not only a functioning internal ear, but of intact pathways to and from the brain centers responsible for the reactions.

The various labyrinth tests have been employed by our government in the examination of aviation recruits. For the reason mentioned, it is clear that aviators must have normal equilibration and orientation. Diseases of remote organs cause vertigo by influences which disturb ones mechanism of balance.

There are two types of spontaneous nystagmus: ocular and vestibular. It is easy to differentiate between these, since the movements of the eyes in ocular nystagmus are equal, while nystagmus due to vestibular irritation has a slow movement and a quick return in the opposite direction.

Jones and Fisher of Philadelphia, who have done a great amount of work in this field, have shown that when stimulation of the internal ear produces no response, or when all the known responses are alike impaired, the lesion is to be found, either in the labyrinth itself or in some portion of the internal ear produces a marked reaction to one test with either absent impaired reaction to the others, it means that the labyrinth and eighth nerve are intact, and that a centrally located lesion is present at some point between the division of the eighth nerve after it enters the brain-stem at the point of contact of the medulla oblongata and the pons. Lesions of the vestibulo-ocular tracts are expressed by nystagmus of shortened duration. While on the other hand, blocking of the vestibulo-cerebello-cerebral pathways is indicated by an impaired vertigo.

The vertiginous attacks in patients who exhibit normal reactions to ear stimulations are explainable by an irritation due to a visual defect, or some focal infection.

I wish to impress upon you the importance of this subject, of which you are to hear more in the future. If the writer has done no more than to stimulate your interest and prepare your minds for future study and consideration of the subject, much has been accomplished.

DR. H. I. LILLIE, Rochester: The technical part of the labyrinthine disturbance is well cared for by Doctor Beaudoux and Doctor Lewis and I would just like to say something with regard to the subject matter of labyrinth disturbance in general symptomatology. The patient generally complains of vertigo. We know that it is a cerebral sensation as all conscious sensations are. It is some disturbance or destruction, as Doctor Beaudoux says, of the eighth nerve, the vestibular branch or its tracts. The general practitioner naturally raises the question; What is this lesion? Roughly, one must be able to say in general where this lesion would be. If, in a given patient with a labyrinthine disturbance, vertigo, nausea, vomiting occurs, one may say nearly where that lesion is. That is what interests the general practitioner. If that patient hears, you are not dealing with a supprative process of the labyrinth. By examining the eyes you will see whether or not there is nystagmus. Nystagmus is best brought out by having the patient turn the eyes to one side and then the other. You will see rhythmical movements. By this you will know that you are dealing with nystagmus. If the patient hears, you are not dealing with a suppurative process and therefore you have time to make a very careful differential diagnosis. If, in conjunction with chronic suppuration of the middle ear the patient has a sudden labyrinthine syndrome we are more anxious about him because it means etiher circumscribed labyrinthitis or a diffuse labyrinthitis, and if suppurative it calls for immediate surgical intervention. So, in the interest of the patient, then, we must always go into the history of his ear condition, whether there has been a suppurative process in the ear or not. Recently there came to my clinic a patient who, without any previous ear history, rather suddenly developed a labyrinth syndrome. She heard perfectly. In a careful history I found that this came on suddenly after blowing the nose very hard. Examination of the ear showed nothing but lack of tonus of the membrane. With the aid of the otoscope for examination of the motility of the membrane we found that there was no response to the compression and rarefaction of the canal. She heard perfectly, so therefore the process was not suppurative, and our labyrinth test demonstrated that the labyrinth was hyperactive.

One such patient had come under my observation who had blown his nose very hard, had this syndrome, and was confined to bed for several days until the symptoms subsided. Such a syndrome we have felt is due to change of the intralabyrinthine pressure.

DR. CHARLES R. BALL, St. Paul: Doctor Beaudoux has given a very interesting paper on a very important subject. The time has come when we must stop guessing as to whether an individual has vertigo or not, and whether that vertigo is of organic or functional origin. We must interpret Barany's tests as we have come to interpret all other tests

and reflexes in our examinations. If a test is negative and our patient complains of vertigo, we must not assume for that reason that his vertigo may not be organic in origin. Barany's tests, when they are negative, are like all other negative tests. They do not exclude the possibility of organic disease.

In a case in which I was associated with Doctor Beaudoux—a medicolegal case—the patient complained of a great deal of vertigo. We made these tests: the galvanic and caloric, and found on the side in which deafness was complained of, that both tests reacted positively, i. e., there was no reaction, while on the other side there was a regular and normal response.

Our colleagues, on the other side of the case did not make these examinations. They concluded, therefore, that the trouble was a hysterical one and when they came to testify in the trial, they so testified. We, on the other hand, testified positively that there was an organic and serious condition because we had these positive tests to guide us. We knew we were right; while our colleagues honestly, however, thought, through a lack of thoroughness in their examination, that we were faking on our testimony in the case. It was the old story over again of "where ignorance is bliss, it seemed folly to be wise." These tests should be made in all cases where vertigo is a symptom. If a patient says that he is paralyzed and unable to walk, we do not sit on the bed and speculate as to whether this paralysis is imaginary or not, but we examine his reflexes and determine whether or not he can walk. We accertain by examination whether there is any disturbance of the continuity of the nerve supply to the lower extremities, so in cases where vertigo is complained of these tests must be carefully made as a part of our regular examination.

DR. BEAUDOUX (Closing): The one thing which I wish to emphasize, besides the fact that wherever we are confronted with vertigo, dizziness and vomiting, and, as I have already stated, the possibility of these symptoms having a direct and indirect relation to the middle ear, are the cases that present themselves with the mild symptoms of dizziness, some staggering and the often described sinking feeling, for these are the cases that have been for a long time misunderstood and allowed to suffer without relief. Let me illustrate by briefly relating a few cases: First, a male, age 64, began to complain of having sinking spells with vertigo and dizziness while splitting wood, which he did as a matter of exercise and pastime. He had seen several physicians and had been thoroughly examined without any suggestion as to the causative factor of his condition. After going through all the ear examinations necessary to make a diagnosis, I found that he had a hyper-sensative labyrinth which was hyperexcited by the use of a metallic mall and a metallic wedge. The high-pitched resounding note of these two metals coming in contact with each other was accountable for his symptoms, and after advising him to use a wooden mall to split his wood, his symptoms entirely disappeared without any recurrence. The second case of the same variety was that of a man who was unable to ride in his automobile, and had been obliged to draw to the curb several times for fear of meeting with some accident, and once had to be taken home by his son. After several negative examinations made by his family physician, internists, and others, I was able to trace his trouble to the high-pitched whistle of his engine which, when removed, left him with a complete cure of his fainting spells, dizziness and vertigo. The third case was that of a physician, a member of this society, who became suddenly dizzy and had an attack of vertigo and staggering after having played base ball with the home team on a summer's day. This patient was referred to me by Dr. Greene, who had examined him carefully without finding the actual cause of his trouble, except that it might be due to some labyrinth disturbance. His suspictions were all confirmed by examinations and tests. He was told that it would be necessary for him to go to the hospital for a month, which he did not do for three of four weeks, but finally fully recovered after following the above advice. The fourth case was that of a male, age 33, who was helping his wife wax the floors on a hot day, and felt dizzy and fell to the floor and for several months was annoyed by dizziness and staggering of a very serious character. After writing me, I advised him to come to St. Paul where my suspicions were confirmed by the examination of his labyrinth, and a month in bed with treatment and absolute rest brought about a permanent cure. You will, therefore, see that there are various degrees of these symptoms, some of them very slight and yet most annoying and endangering the patient's life and safety. I regret the time alloted for the reading of this paper would not let me relate many of these cases which have come under my notice, but I trust these few cases, as enumerated briefly here, will serve to impress upon your minds the relationship existing between these patients' symptoms and the labyrinth in one form or another.

Minnesota Medicine

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EDITORIAL

SALVARSAN IN THE TREATMENT OF IRITIS, IRIDOCYCLITIS AND NEURORETINITIS

Syphilis as a causative factor in ocular affections plays no small role. Acute syphilitic refractile inflammatory processes involving the optic nerve, retina, and more particularly the uveal tract, require the most potent, efficacious and quickly acting therapeutic agent known to us lest the condition result in serious impairment or total loss of eyesight. The same holds good of chronic inflammatory conditions of like nature, but to a lesser degree. Mercury and potassium iodide still remain the most reliable and efficient remedies in the treatment of syphilis. However, salvarsan acts more promptly and in not a few cases effects a favorable outcome in ocular disease where mixed treatment has failed. This statement should be qualified by adding that in ocular disease of a syphilitic nature we should not rely upon salvarsan alone. The temporary relief of syphilitic symptoms and signs resulting from specific treatment does not necessarily mean the cure of the disease. Salvarsan is but an adjunct to the mercurialization.

From time to time there have appeared in the literature case reports and warnings cautioning against the dire consequences that may befall the eyes of luetics after salvarsan injection. The subject warrants illucidation.

It has been found that atoxyl arsacetin and soamin had definite anti-syphilitic properties, but were abandoned because of their toxic effect upon nerves. According to the statistics compiled by Igersheimer (Arch. Ophthal. Bd. LXXI, 2 Heft.), thirty-seven cases of amaurosis have been reported. That atoxyl has a definite toxic effect upon nerve tissue has been proven by the injection of small and medium doses of the poison into the vitreous humor and under the conjunctiva of rabbits. In chronic poisoning, changes in the medullary sheath of the optic nerve known as the "Marchi reaction" was found.

The detrimental effects of atoxyl, chemical research has shown, are due to the fact that the drug circulates in the blood stream without undergoing decomposition, with the result that toxic tissue changes are produced through faulty elimination. The drug remains unchanged or is eventually transformed by living protoplasms to more poisonous reduction products which become incorporated with the cells. Roethig (Frankfurter Zeitschrift fur Pathologie, Band III, Heft 2) found that a series of aromatic derivatives of arsenic products caused dancing motions in mice, a phenomenon attributed to disturbances of the vestibular nerve.

In view of such untoward results it is little wonder that European clinicians accepted with reluctancy Erlich's new remedy, salvarsan. Wechselmann (The Treatment of Syphilis with Salvarsan, p. 42) in speaking of amaurosis states, "In more than twelve hundred cases we observed no such condition nor any other injury to the eye excepting in two cases, instances where the patients saw flashes of light and darkness before their eyes for a short time, and not even in the large number of cases estimated at twenty thousand in which salvarsan had been injected has any

similar instance been reported". Schanz of Dresden (Munch Med., Wochenschrift, 1910, No. 45) made a special investigation in order to determine the effect of salvarsan in diseases of the eye, and a comparative study of salvarsan and atoxyl in order to determine their influence upon the optic nerve. He points out that atoxyl amblyopia and syphilitic neuritis are distinct and characteristic affections, but more important still, that salvarsan possesses no neurotoxic properties.

If salvarsan produces no toxic effect upon normal ocular tissue, may not other alarming phenomena follow an injection? Isolated cases of iritis, iriditis and neuroretinitis have been reported in which there was exacerbation of symptoms directly traceable to administration of the drug. This may be attributable to the Jarisch-Herxheimer reaction, a clinical entity accountable for any aggravation of syphilitic symptoms following an injection of salvarsan. How is it to be explained? Ehrlich believes that the phenomenon indicates a failure of the injected dose to produce sterilization. Browning observed in the treatment of experimental trypanosomiasis with methyl violet, that a fraction of a dose necessary to produce a disappearance of the parasites actually led to an increase in their number. Iverson corroborated the above fact, using small doses of salvarsan in relapsing fever.

It is then reasonable to suppose that the Jarisch-Herxheimer denotes a temporary stimulation of the spirochaete to increased multiplication and activity. However, in most cases the reaction is produced before the drug has time to exercise its full effect, substantiated clinically by the fact that ultimately all symptoms may disappear without further treatment. At any rate, it is not imperative to administer another dose at an interval shorter than in an ordinary case (C. H. Browning and I. Mackensie, Brit. Med. Jour., Vol. II, 1911, p. 654). The occurrence of the Jarisch-Herxheimer reaction may not be avoided by substituting mercury for salvarsan, for it has been noted by several observers that this phenomenon has resulted under mercurial treatment attested by the development of a rash or the extension or intensification of a rash already present; in fact, before the discovery of the spirochaete or the Wassermann reaction, this clinical manifestation was held as an important diagnostic sign. Erlich (Wien Klin. Rundschau, Jan. 29, 1911) in the defense of his new preparation stated that the pathological disturbances of the optic nerve in recent cases of syphilis may occur not only after salvarsan injection, but also after the use of mercury.

To arrive, then, at a satisfactory basis for therapy, we may adopt the following conclusions:

1. Salvarsan, unlike atoxyl, arsacetin and soamin, possesses no neurotoxic properties.

2. The almost unanimous opinion is that arsenobenzol is innocuous to the healthy eye. Should ocular lesions occur following the administration, they are manifestations of syphilis and require vigorous treatment.

3. In the treatment of iritis, iridocyclitis and neuroretinitis of syphilitic origin, salvarsan should be administered and supplemented by mercurialization. Salvarsan is recommended because of its potency and ability to cut short the ocular syphilitic pathological process.

4. The possibility of exaggerating temporarily the syphilitic ocular phenomena, exemplified by the occurrence of the Jarisch-Herxheimer reaction, following salvarsan injection, is no contraindication to its use. Such a reaction may take place after mercurialization.

5. For reasons already cited, small doses of salvarsan are more likely to produce the Jarisch-Herxheimer phenomenon than large doses. The conclusion derived therefrom is self-evident.

THE PANDEMIC OF INFLUENZA

The present pandemic of influenza started in Spain, hence the term "Spanish Influenza" for what was formerly known as "Russian Influenza;" subsequently Portugal, France, Holland, Germany, Austria, Hungary, Russia, Italy, Switzerland, Sweden, Norway, Denmark and Great Britian were invaded. South and West Africa, India, Australia, South America, the West Indies and Canada have all suffered severely from its ravages as have we in the United States.

The invasion has followed well known routes of travel, especially shipping, and has, no doubt, been greatly accelerated by the movement of large bodies of troops. As is well known, the disease has made itself felt with more or less severity amongst most of the armies in the field. In seeking a factor influencing its spread some writers point out that the conditions of living have for some time been abnormal, especially abroad, and that the people have been suffering from an unusual strain, both mental and physical. Many persons unaccustomed to hard work are engaged in laborious tasks in munition factories and the like; and a great many women have replaced men in sundry arduous occupations. Together with food restrictions, it is quite possible that these circumstances and the unaccustomed manner of living have led in a proportion of instances to lowered vitality and weakened resistance to disease.

The definition of "influenza" is difficult, and it has not yet been determined in the present pandemic whether we are dealing with one disease or with a group of respiratory infections. Further study is needed along these lines.

A good deal of doubt has been cast on the part played by the *B. influenzae* of Pfeiffer as the causative agent. Out of a large number of workers few have found this bacillus with any degree of constancy. Mathews, however, isolated the bacillus in all of twelve cases examined. Dietrich found it in his first seven post-mortem examinations. Bergmann isolated it in fifteen out of twenty sputa examined. Evre and Lowe isolated it from twelve out of fourteen sputa. In Germany, Neufeld and Papamarku, Pfeiffer, Gotschlich and Uhlenhuth report that in the more recent cases they have found the bacillus not infrequently. McIntosh, writing in the London Lancet, raises the question whether the methods and media used for the isolation of the *B. influenzae* have been at fault, as the organism belongs to the delicate group of hemophilic bacteria which require special media for their isolation. Using exclusively trypsinised blood-agar this investigator in fifty-six unselected cases isolated the bacillus of influenza in 75 per cent. Of course the isolation of this organism from the sputa and from the lungs post-mortem does not prove the *B. influenzae* is the cause of influenza. It must be borne in mind that the mere association of a micro-organism with a particular disease does not entitle it to be described as the cause. McIntosh believes that in acute influenza there is probably an invasion of the respiratory tract by the influenza bacillus, their growth is accompanied by the production of toxic bodies, which injure the mucosa and on absorption produce a general malaise. In the more severe cases the fine bronchi and the alveoli of the lungs are affected. In the latter the walls of the capillaries, as well as the walls of the alveoli, are injured, with the result that a serous exudate takes place. In parts this exudate completely fills up the alveoli, and on this account sections of the affected lung produce a picture strikingly like that produced by phosgene gas poisoning. The second stage of the disease consists of an infection of the damaged tissues and serous exudate, with one or several of the pathogenic bacteria which are to be found normally in the respiratory tract. Thus a secondary septic bronchopneumonia is set up.

In regard to preventive vaccination in influenza, at a recent conference held at the War Office in London, at which Colonel Sir William Leishman, Deputy Surgeon-General Bassett-Smith, and other prominent British medical men were present, it was unanimously agreed that inoculations with a suitable vaccine might be expected to be of value in the control of the incidence and severity of the epidemic. The appropriate constitution of such a vaccine was thoroughly discussed in the light both of the personal experience of the members of the conference and of the information available from medical literature. It was agreed that the three following organisms only should be employed, the bacillus influenzae, the pneumococcus, and the streptococcus. In each instance it was decided that a number of different strains and types of each organism should be utilized in the preparation of the vaccine, and that these strains should have been recently isolated from cases occurring during the present epidemic and should be submitted to strict tests as to race and type prior to use.

THE ANNUAL MEETING OF THE SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The Southern Minnesota Medical Association will hold its annual meeting at Mankato on January 20th and 21st. The sessions will be held in the Auditorium of the Elk's Club, and an excellent program is promised. The committee on arrangements desires to make the following announcements:

Physicians are cordially invited to bring their wives.

Hotel reservations should be made early as per the return cards which are now being mailed.

Applications for membership and payment of dues—Secretary's desk—Dr. H. T. McGuigan.

The President reserves the right to change the order of papers.

All papers are limited to fifteen minutes—Discussion, five minutes.

The physicians of Mankato will entertain the society at the annual dinner on Tuesday noon at Masonic Hall at 12 o'clock.

The scientific program is open to the public. The program is as follows:

EVENING SESSION

Monday, January 20, 1919

AUDITORIUM ELK'S CLUB

President's Address.

Fractures Considered as Potential Deformities.
Dr. M. S. Henderson, Rochester, Minn.

Some of the Old Hospitals of London, with Special Reference to the Surgical Treatment of Fistulo-in-ano as Perfected at St. Mark's.
Dr. W. J. Mayo, Rochester, Minn.
Discussion:
Dr. Archibald MacLaren, St. Paul, Minn.

Refractive Needs in Children.
Dr. Earl A. Loomis, Minneapolis, Minn.
Discussion:
Dr. E. W. Benham, Mankato, Minn.
Dr. J. H. James, Mankato, Minn.

Acute Mastoiditis.
Dr. J. D. Lewis, Minneapolis, Minn.
Discussion:
Dr. V. I. Miller, Mankato, Minn.
Dr. Horace Newhart, Minneapolis, Minn.

Placenta Praevia and Abruptio Placentae.
Dr. M. J. Jensen, Minneapolis, Minn.
Discussion:
Dr. G. A. Dahl, Mankato, Minn.
Dr. C. G. Weston, Minneapolis, Minn.

The Treatment of Fractures—New Methods and New Apparatus Used.
Dr. A. E. Wilcox, Minneapolis, Minn.
Discussion:
Dr. A. N. Collins, Duluth, Minn.
Dr. A. R. Colvin, St. Paul, Minn.

MORNING SESSION

Tuesday, January 21, 1919

Annual Business Meeting 8:30 A. M. Sharp
Scientific Program 9:00 A. M.

Roentgen Examination in Eye Injuries.
Dr. C. A. Donaldson, Minneapolis, Minn.
Discussion:
Dr. W. L. Benedict, Rochester, Minn.
Dr. Russell D. Carman, Rochester, Minn.

A Neisser—Luetic Outlook.
Dr. Harry A. Baker, Minneapolis, Minn.
Discussion:
Dr. Harry Irvine, Minneapolis, Minn.
Dr. F. R. Wright, Minneapolis, Minn.

The Treatment of Chronic Empyema.
Dr. C. A. Hedblom, Rochester, Minn.
Discussion:
Dr. J. W. Little, Minneapolis, Minn.
Dr. S. C. Schmitt, Minneapolis, Minn.

The Child Welfare Division of the State Board of Health.
Dr. E. J. Huenekens, Minneapolis, Minn.
Discussion:
Dr. Helen Hielscher, Mankato, Minn.
Dr. J. H. Adair, Owatonna, Minn.

Basal Cell Epithelioma.
Dr. A. C. Broders, Rochester, Minn.
Discussion:
Dr. Gordon B. New, Rochester, Minn.
Dr. A. W. Adson, Rochester, Minn.

A Toast to the Minnesota Medical Men in Service at Home and Abroad.
Dr. H. J. O'Brien, St. Paul, Minn.

AFTERNOON SESSION

1:00 P. M.

Prophylactic Inoculation Against Pneumonia and Influenza.

Dr. E. C. Rosenow, Rochester, Minn.

Open to General Discussion.

Chronic Ulcerative Colitis.

Dr. Arthur H. Logan, Rochester, Minn.

Discussion:

Dr. E. T. F. Richards, St. Paul, Minn.

Dr. Frank S. Bissell, Minneapolis, Minn.

Some Legal Aspects of Medicine and Surgery.

Mr. Geo. W. Peterson, Attorney at Law, St. Paul, Minn.

Subject to be announced later.

Dr. C. P. Robbins, Winona, Minn.

Discussion:

Dr. W. S. Lemon, Rochester, Minn.

Some Remarks on Epidemic Influenza.

Dr. James S. Gilfillan, St. Paul, Minn.

OBITUARY

DR. OTTO R. OLSEN

Dr. Otto R. Olsen of Winona died at his home on December 11, 1918, of pernicious anemia from which he had suffered for the last four years.

Dr. Olsen was born February 12, 1879. He attended the public schools of Winona and in 1901 graduated from Rush Medical College. He then located in St. Charles, where he engaged in the practice of medicine and surgery until failing health compelled him to give up this work. He is survived by one son, Murray Olsen of St. Charles, and by his mother and two sisters of Winona.

DR. R. S. MILES

Dr. R. S. Miles for many years a prominent physician of Glencoe and later of Excelsior, died in Tacoma, Wash., on Nov. 16, 1918. He had been in ill health for several years.

Dr. Miles was born in Belmont county, Ohio, in 1840. He served through the Civil War and soon thereafter removed to Carver county, Minnesota. In 1917 he moved to Tacoma, Washington, where he resided at the time of his death. He is survived by two sons, Dr. Robert S. Miles, Jr., of Tacoma, Wash., and Harry Miles of Owasso, Mich.

DR. C. F. MORELL

Dr. C. F. Morell of Brainerd, died on November 14, 1918, after several days of illness of pneumonia following an attack of influenza,

Dr. Morell was born in Verndale, Minn., August 26, 1887. He attended the University of Minnesota and after graduation served as intern for one year and a half at the City Hospital, Minneapolis. He practiced in Verndale for two years, and on July 1, 1918, became associated with Dr. Thabes of Brainerd.

The funeral was held on Saturday, November 16th under the auspices of the Masonic order, of which he was a prominent member.

DR. ALFRED M. WANG

Dr. Alfred M. Wang, a resident of Minneapolis for the past twenty-five years, died at his home, 65 South Eleventh Street, on Nov. 13, 1918. He had been ill for several years.

Dr. Wang was born in Norway in 1861 and obtained his early education in various European cities. He was a graduate of the medical college of the Northwestern University, Chicago, and took post-graduate training in Vienna and Berlin. He was a member of the Hennepin County Medical Society. He is survived by his widow and one sister. The funeral took place on Friday morning, Nov. 15th, with interment in St. Mary's Cemetery. Minneapolis.

OF GENERAL INTEREST

Dr. W. V. Lindsay, Winona, has moved to Fertile, Minn.

Dr. C. E. Gates, formerly of Goodhue, has moved to Anoka.

Dr. W. C. Dietrick of Waverly has moved to Truman, Minn.

Dr. A. G. Moffatt has returned to Howard Lake from Ford Sheridan, Ill.

Dr. H. E. Lucas, Champlin, has gone to Texas, where he expects to spend the winter.

Lieutenant A. E. Phillips of Delano has returned to his home from Fort Riley, Kansas.

Dr. Charles M. Tierney, Granger, Minn., after a severe illness has resumed his practice.

Dr. A. P. Lommen, who has been at Camp Shelby, Miss., has returned to his home in Lanesboro.

Dr. Theodore Holtan of Kilkenny, has entirely recovered from a severe attack of pneumonia.

Dr. O. L. Asher of Osawatomie, Kansas, has moved to St. Peter, Minn., and has taken up work at the State Hospital.

Dr. Charles F. McNevin, of St. Paul, has been ordered to San Juan, Porto Rico, according to word received recently.

Dr. H. E. Peterson, of Graceville, has moved to Granite Falls, where he has taken over the work of the late Dr. H. Kerns.

Dr. G. T. Ayers, Ely, Minn., is now stationed at Fort Sill, Oklahoma, having been transferred from Scott Field at Belleville, Ill.

Dr. Jules Gendron, Grand Rapids, Minn., has been transferred from Fort Oglethorpe, Ga., to Camp Sheridan, Montgomery, Alabama.

Dr. W. P. Lee, of Northfield, has returned home from Fort Riley, Kansas, where he has been attending a medical officers training camp.

Dr. A. E. Benjamin of Minneapolis, who has been at Camp Wheeler for the past four months returned to his home on December 10th.

Dr. W. B. Linton of Rochester, has been assisting Dr. R. M. Phelps at the State Hospital, St. Peter, during the recent influenza epidemic.

Dr. Warren A. Dennis, St. Paul, now serving in France, was recently commissioned a Colonel in the Medical Reserve Corps, according to word received recently.

Dr. Oliver S. Olson, Duluth, who recently left for Fort Riley, Kansas, expects to receive his discharge from the army and to be home again within a very short time.

Dr. I. M. Radman was mustered out of the Medical Reserve Corps at Ft. Leavenworth, Kansas, and returned to his home at Onamia, Minn., on December 16, 1918.

Dr. Walter R. Ramsey, St. Paul, now stationed at Rouen, France, was recently commissioned a Major, according to word received recently from Washington.

Dr. A. A. Giroux of Dalton, will take a six months' course in pediatrics at the University of Minnesota. During this time Dr. Giroux and his family will make their home in St. Paul.

Dr. L. L. Craven, formerly of Deer River, is now located at Kelly Field No. 1, San Antonio, Texas. Dr. Craven entered the service last spring and was recently given a captaincy.

Mrs. H. W. Hill, wife of Dr. H. W. Hill, secretary of the Minnesota Public Health Association, died at the University Hospital on November 27th of pneumonia, following influenza.

Word has been received by Mrs. E. J. Abbott, St. Paul, that her son, Dr. John Steele Abbott, who has been held a prisoner by the Germans since March, 1918, has arrived at an English port.

Lieutenant Carl Drake, St. Paul, who has been stationed at Fort Sill, Oklahoma, for the past ten months, spent a few days in St. Paul recently before going to Camp May, N. J., to join a base hospital unit.

Debarkation Hospital No. 3, located at Eighteenth Street and Sixth Avenue, New York, with accommodation of 4,000 beds and a large staff of medical officers, has established a reading room for its medical and surgical staff.

Close upon the announcement that Dr. P. C. Pilon of Paynesville had been promoted to the rank of major, comes the news that Dr. Geo. Rice, at one time connected with the Pilon Hospital, formerly a captain, has been given the same honor.

Dr. J. P. Sedgwick, chief of the department of Pediatrics, University of Minnesota, was recently notified of his appointment as consulting hygienist on pediatrics to Dr. Rupert Blue, surgeon general of the United States Public Health Service.

Dr. H. F. Gammons, superintendent of the Deerwood Sanitarium has been appointed director of the publicity department of the Texas State Sanitarium for Tuberculosis at Carlsbad, Texas, and left on December 8th to take up his new position

Dr W. H. Replogle of Wabasha arrived home on December 9th after serving in the medical corps for one month at Fort Riley, Kansas. He received a captain's commission before leaving Wabasha, but received an honorable discharge and has returned to resume his practice there.

Through the death of Dr. H. N. Schmidt, Westbrook, Minn., is without a physician. A very good opening exists there for the right man. Information can be obtained by communicating with Dr. C. P. Nelson, 408 Physicians and Surgeons Building, Minneapolis.

Information that Captain Paul F. Brown of Pipestone, has been recommended for promotion to the rank of Major in the Medical Reserve Corps has been received by his parents, Mr. and Mrs. W. B. Brown, of Pipestone. Distinguished services performed by Captain Brown at Argonne are mentioned in the recommendation for his promotion.

The Medical School of the University of Minnesota offers to the county societies of the state the assistance of the faculty by way of addresses, papers or demonstrations, which may be of interest to their members. Invitation for assignments to the programs of the societies may be sent to Dr. R. O. Beard, assistant Dean, Medical School, University of Minnesota.

Dr. Francis D. Patterson, chief, Division of Industrial Hygiene and Engineering, Department of Labor and Industry, Harrisburg, Pa., is desirous of obtaining a complete list of all physicians engaged in the practice of industrial medicine.

It has been the practice of this department to hold semi-annual conferences of industrial physicians and surgeons for several years. These conferences are well attended, and a great deal of valuable matter is presented in the discussions. In order to reach all physicians interested it is desirable to have their names upon the mailing list. The next conference will be held early in 1919, and it is, therefore, essential that the names and addresses of all industrial physicians and surgeons be in Dr. Patterson's hands as soon as possible after January 1st.

NEW AND NON-OFFICIAL REMEDIES

During November the following articles were accepted by the Council on Pharmacy and Chemistry for inclusion with New and Non-Official Remedies:

National Pathological Laboratories:
Rabies Vaccine (Harris).

Schering and Glatz:
Creosote Carbonate, S. and G.
Guaiacol Carbonate, S. and G.

NEW AND NON-OFFICIAL REMEDIES

Lutein Tablets.—H. W. and D., 2 Grains. Each tablet contains 2 grains of lutein (the fully developed corpora lutea of the hog, dried and powdered). Hynson, Westcott and Dunning, Baltimore, Md. (Jour. A. M. A., Nov. 2, 1918, p. 1485).

Rabies Vaccine (Harris).—An antirabic vaccine standardized by the method of Dr. Harris and stored in vacuo. Each package contains vaccine and apparatus for the administration of one complete treatment. One dose is given daily for ten days or more. National Pathological Laboratories, Chicago. (Jour. A. M. A., Nov. 30, 1918, p. 1825).

PROPAGANDA FOR REFORM

Peneguents.—Indiana physicians have been visited by the representative of the American Ointment Company who distributes samples and discourses on "Peneguents." He admits that his preparations have not been accepted by the Council on Pharmacy and Chemistry, but attempts to offset this by a report of the National Research Council which he hands out with other "literature." A glance at the Ointment Company's "literature" makes it clear that its preparations could not be admitted to New and Non-Official Remedies. The report of the Research Council does not pretend to pass on the therapeutic usefulness of the preparations, but apparently was made to check the statements made in regard to their composition. It brings out that the composition of the ointment base is not divulged by the manufacturer, and that "Peneguent Chlor-Iodine," claimed to contain "Iodine Resub. 5 per cent," contains but 0.37 per cent free iodin, the remaining iodin having combined with the ointment base. Since the complex and semisecret character of their formulas and the unwarranted claims should have been sufficient to preclude the use of these proprietaries by the U. S. Army, it is difficult to understand why the examination was made. (Jour. Ind. State Med. Ass'n, Oct. 15, 1918, p. 374).

Digestive Absurdities.—Scientific investigations have demonstrated beyond any doubt the irrationality of the combinations of digestive ferments which go to make up the various brands of aromatic digestive tablets, and all chemists and manufacturing pharmacists are familiar with these facts. The excuse for manufacturing them is that there is a call for them. It is a question whether the physician who ignorantly prescribes aromatic digestive tablets is not more morally culpable

than the pharmaceutical house that supplies what such physicians demand. (Jour. A. M. A., Nov. 2, 1918, p. 1489).

Dependability of Dosage in Tablets.—One of its products (Aromatic Digestive Tablets) having been reported deficient by the Connecticut Agricultural Experiment Station, the Harvey Company, Saratoga Springs, N. Y., holds that it should not be criticized if its Aromatic Digestive Tablets are below the declared strength. It seems to hold the opinion that it does not matter whether or not these tablets contain the amount of ferments claimed on the label, since in any case these ferments would mutually destroy each other as soon as such a tablet came in contact with the digestive secretion. No excuse can be offered for those physicians who prescribe such absurdities as Aromatic Digestive Tablets, but neither is there any justification for a firm selling a product which it knows will not measure up to the claims made for it. (Jour. A. M. A., Nov. 2, 1918, p. 1510).

Value of Vaccination Against Influenza.—There is no conclusive evidence that the Pfeiffer bacillus plays any greater role, if as great, in the present epidemic than any other bacteria found in the respiratory tract in this disease. Also, the influenza bacillus is a very poor antigen. There is, in fact, nothing to show that definite antibodies against this bacillus develop in the course of influenza. Animal experiments show that it requires prolonged immunization before any response becomes apparent. Again, there is no record of controlled experiments on human beings with influenza vaccine. From this it is evident that vaccination against influenza is in a wholly experimental stage. (Jour. A. M. A., Nov. 9, 1918, p. 1583).

More Misbranded Nostrums.—The following nostrums have been proceeded against under the Federal Food and Drugs Act: Baker's Tubercular Remedy, containing 11 per cent alcohol by volume, sugars, potassium iodid, ammonium chlorid, glycerin, licorice, plant extractives, etc. Lee's Save the Baby Croup Specific, a liniment with a fatty oil base containing camphor, rosemary and thyme; Lee's Croup Mixture, containing over 70 per cent of lard, about 7 per cent alcohol, and over 18 per cent volatile oils, consisting of a mixture of oils of rosemary and thyme and camphor; Twentieth Century, consisting of a powder and a solution, the latter, essentially a mixture of water, glycerine, lead and zinc sulphates, acetates, nitrates, and a small quantity of perfume; Moreau's Soothing Wine of Anise, a syrup containing morphine acetate and alcohol, and flavored with anise. Professor C. E. Matthai's Victory, containing 49 per cent alcohol, 1.2 grains of opium to the fluid ounce and 3.5 per cent camphor and volatile oil, and small amounts of red pepper. Seniapersa, tablets containing asafetida, cannobis indica, and a drug containing a mydriatic alkaloid. (Jour. A. M. A., Nov. 9, 1918, p. 1601).

More Misbranded Nostrums.—The following "patent medicines" have been declared misbranded under the U. S. Food and Drugs Act, and a "Notice of Judgment" giving an account of the prosecutions issued by the U. S. Department of Agriculture for each: Jacob's Liver Salt, an effervescent preparation consisting largely of sodium phosphate, sodium sulphate, and sodium chloride; Lydia Pinkham's Vegetable Compound, containing 17.9 per cent alcohol, and 0.56 gm. of solids to each 100 c.c., with vegetable extractive material present; Maguire's Extract of Benne Plant and Catechu Compound, containing over 39 per cent of alcohol and 1–10 grain of morphine to each fluid ounce, besides camphor, catechu and peppermint; Hood's Sarsaparilla, a mixture of alcohol and water, containing about 0.9 per cent of potassium iodid with sugar, vegetable extractives, which give indications of the presence of sarsaparilla, licorice, and a laxative drug resembling senna; Booth's Hyomei Dri-Ayr, consisting essentially of oil of eucalyptus, together with a small amount of resin-like solids and a mineral oil and a little alcohol; Hill's Kidney Kaskara Tablets, an iron oxide, sugar-coated tablet carrying emodin, caffein, acid resin, magnesium carbonate and talcum; Hancock Sulphur Compound, a calcium sulphid solution; Hancock Sulphur Compound Ointment, a petrolatum ointment containing sulphur, ash (chiefly lime) and phenol; Palmer's Skin Whitener, containing ammoniated mercury, mixed with a fatty base; Grossman's Specific Mixture, a balsam copaiba mixture. (Jour. A. M. A., Nov. 16, 1918, p. 1681).

A Short Sighted Druggist.—A correspondent writes: "I went to a nearby drug store and asked for twenty-five cents worth of Liquor Antisepticus Alkalinus; I got one ounce! The druggist charged me fifteen cents an ounce, and ten cents for the container. Next time I fear I shall be forced to get "Glycothymoline!" To penalize a man who calls for an official product so as to drive him to ask for a "patent medicine" of the same general character is both poor pharmacy and bad business. (Jour. A. M. A., Nov. 23, 1918, p. 1745.)

Kennedy's Tonic Port.—Kennedy's Tonic Port was booze sold as "patent medicine." Its conflict with the law came when a bottle of the preparation was sold at a Regina drug store in November, 1917, in that the sale of alcoholic beverages is prohibited in Saskatchewan. The Saskatchewan authorities proceeded against this concern, and the drug store proprietors were convicted and fined. They appealed the case, but the judge before whom the appeal was heard decided against the concern and increased the fine. Booze is booze in Saskatchewan. (Jour. A. M. A., Nov. 23, 1918, p. 1763.)

Compound Solution of Cresol.—In an eastern institution where members of the U. S. Hospital Corps are being instructed, a bottle containing Liquor Cresolis Compositus is labeled "Lysol" so that doctors may recognize it. Comment is superfluous. (Jour. A. M. A., Nov. 30, 1918, p. 1830.)

Autolysin and Beer.—Henry Smith Williams, who exploits "Proteal Therapy," also runs a publishing concern, the Goodhue Company, and has associated with him his brother, Edward Huntington Williams. Some time ago, complimentary copies of a book, "Alcohol, Hygiene and Legislation," written by Edward Huntington Williams, and published by the Goodhue Company, were sent broadcast to physicians with the compliments of author and publisher. The book championed the

lighter alcoholic beverages and questioned the value of prohibition. Enclosed with the book was an advertising leaflet on the "Autolysin" cancer cure and a letter calling attention to a book by Henry Smith Williams on the Autolysin Treatment of Cancer. Now the secretary of the United States Brewers' Association has testified before a Senate Committee, according to newspaper reports, that a "Dr. Edward H. Williams" was employed to write articles "relating to the brewers' trade." Is the Dr. Edward Huntington Williams who wrote "Alcohol, Hygiene and Legislation" the "Dr. Edward H. Williams" who was employed by the brewers to write propaganda favorable to the brewing interests? Was the cloth-bound book, "Alcohol, Hygiene and Legislation," paid for, wholly or in part, by the United States Brewers' Association. (Jour. A. M. A., Nov. 30, 1918, p. 1846.)

Spencer's Chloramine Pastilles.—The term "chloramin" is applied to a class of chemical compounds that contain the group: NCL. The chloramin derivative sodium paratoluene-sulphochloramid has been called chloramin-T, "chloramin" indicating the character NCL group, and the "T" derivation from toluene. Sodium parabenzenesulphochlooramid has been cholramin-B, the "B" indicating its origin from benzene. Before cholramin-T and the related products came into use in medicine, John Wyeth and Brother had registered the term "chloramine" as a trademark for a pharmaceutical preparation and applied it to a lozenge containing ammonium chloride, "Spencer's Chloramine Pastilles," which in no sense is a chloramin. This misuse of a chemical term indicates the need of a revision of our trademark law which permitted the registration of this evidently misleading term. (Jour. A. M. A., Nov. 30, 1918, p. 1848.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

THE SOUTH-WESTERN MINNESOTA MEDICAL SOCIETY

The thirty-second annual meeting of the South-Western Medical Society was held in Worthington, on December 13, 1918. In the absence of Dr. Piper, the president, and Dr. Leebens, the vice-president, Dr. Weiser was elected president, pro tem. The following members responded to the roll call: Drs. Mork, Dolan, Smallwood, Weiser and Watson. One visiting physician, Dr. J. A. Watson of Minneapolis, also was present. The minutes of the May meeting were read and approved. One new member, Dr. M. L. Goldberg, was elected to membership. A motion was carried that the president appoint a committee to draft resolutions on the death of Dr. King, a copy of which is to be kept on file in the records of the society, and one sent to Mrs. King. Drs. Spalding, Dolan and Watson were appointed and the following resolutions were drafted:

Whereas, it has pleased Almighty God to take from us our esteemed member, Lieut. Emil King,

Therefore, be it resolved, that we deeply deplore the loss of one who so long and faithfully served us as secretary, and whose presence and genial smile always caused a feeling of good fellowship!

We extend to his bereaved wife and family our sincere sympathy and assure them that we too mourn the loss which is so hard to bear, and may they have the consolation that he had not lived in vain. What greater honor than to have died in the defense of his country.

A. E. Spalding,
C. P. Dolan,
F. G. Watson.

The following officers were elected for the ensuing year: President, Dr. J. T. Smallwood; vice-president, Dr. E. G. McKewon; secretary-treasurer, Dr. F. G. Watson. Drs. Spalding and Taylor were elected as censors for three years, their term to expire in 1921. Dr. Smallwood was elected as a delegate to the state meeting and Dr. Watson as an alternate.

Owing to the small attendance it was decided to postpone the reading of the paper written by the late Dr. King, till the May meeting.

The scientific program, which follows, was then carried out:

Intestinal Obstruction, Dr. A. E. Spalding, Luverne, Minn.

The Seventh Sense, Dr. J. A. Watson, Minneapolis, Minn.

F. G. WATSON, Secretary.

PROGRESS IN MEDICINE AND SURGERY

HYPOPHYSIAL TUMORS THROUGH THE INTRADURAL APPROACH: A. W. Adson (Journal of the American Medical Association, 1918, lxxi, 721-726) states that his attention was called to the possibilities of the intradural approach to the hypophyses by Dr. G. H. Heuer of Johns Hopkins Hospital. Having obtained satisfactory results with this type of operation he reports a series of cases and describes the technic employed in the Mayo Clinic.

In a brief review of the literature it was found that the first successful extracranial trans-sphenoidal pituitary operation was performed by Schloffer in 1907. Since then, there have been numerous modifications of the trans-sphenoidal approach as well as descriptions of the transtemporal and transfrontal approaches, all of which are extradural until the sella or clinoid processes have been reached and then when the dura is incised sufficiently to expose the hypophysis.

The cases discussed by the author were patients suffering from visual disturbances; one of whom had metabolic interference. The operative procedures are: (1) A craniotomy with turning of a large osteoplastic flap over the right fronto-motor area. (2) A horse-shoe incision in the dura with its base along the posterior margin of the craniotomy. (3) Lowering of the head to permit outward gravitation of the right frontal lobe. (4) Covering the cortex with cotton and shingling it with strips of rubber tissue to avoid injury from retraction. The strips are placed on the dural flap and over the cortex as the frontal lobe is elevated, and exposure is thus obtained without stripping the dura from the

anterior cranial fossa. (5) Exposure of the hypophysis is further assisted by gently elevating the frontal lobe with an especially adapted retractor supplied with an electric light. (6) As the frontal lobe is elevated the anterior cranial fossa, the lesser wing of the sphenoid, the right olfactory nerve, the anterior clinoid process, the right optic peduncle, the right internal carotid, the optic commissure and the hypophysial lesion and left optic peduncle are revealed. (7) The optic peduncle and the commissure are gently freed and all, or the desired amount of the tumor or the hypophysis may be removed.

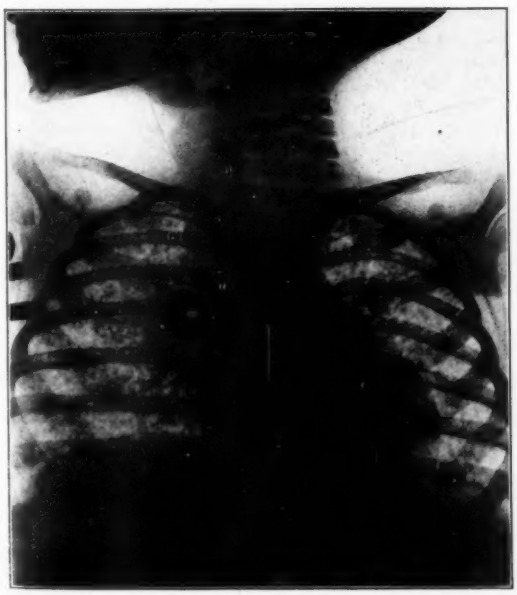
The particular advantages of the operation are, first a dry field, free from infection, and second, excellent exposure of the optic commissure and the hypophysial lesion, besides permitting radical treatment of the lesion without serious trauma of the commissure and optic peduncles since the sponging and the control of hemorrhage are done downward against the floor of the sella instead of upward against the commissure, peduncles and brain.

ACUTE MILIARY TUBERCULOSIS: Beverly A., aged sixteen months, was admitted to the Division of Pediatrics on Sept. 26, 1918, with diagnosis of malnutrition, made by the referring physician. The family history was negative except for pulmonary tuberculosis in mother's sister, with whom patient had not been in contact.

Present illness began with an attack of measles in March. Loss of weight has been progressive and there has been a slight rise of temperature every day. Both ears have discharged pus all summer. Appetite has been good and child has been on a liberal mixed diet.

A week ago a cold was contracted and since then there has been a cough.

This patient was referred to the Roentgen department on Sept. 30th under suspicion of pulmonary tuberculosis.



Von Pirquet was reported negative as were all laboratory tests. Physical signs were either absent or very indefinite in character.

The Roentgen findings were very characteristic of Miliary Tuberculosis, the lesions being diffusely disseminated throughout both lung fields.

This case is of interest chiefly because the diagnosis depended solely upon the Roentgen evidence. Objective physical signs and positive laboratory evidence were lacking.

This is almost universally true in acute miliary tuberculosis. F. S. BISSELL.

THE NERVOUS MANIFESTATIONS OF SYPHILIS OF THE EYE: J. Collins (Amer. Jour. of Med. Sciences, May, 1918) gives the results of an analysis of 790 cases of syphilitic disease of the nervous system observed at the Neurological Institute of New York City. One-half of these were examples of tabes and general paresis and in 335 of these 395 cases, the size, shape and circularity of the pupil were disordered. He regards disorder of the circularity of the pupil, in the absence of obvious attributable cause, such as iritis, scleritis or similar inflammatory conditions, as suggestive of syphilis; and a warrant for the study of the cerebrospinal fluid, although it must be admitted that such alterations do occur in healthy individuals. Uhthoff found such anomalies in two per cent of 14,392 cases; others who investigated much fewer cases found a larger percentage—Ivanhoff, 9 per cent; Dufour, 4 per cent.

Collins found Argyll Robertson pupils in 467 of the 790 patients; he considers failure of the pupil to react to light as the only infallible sign of syphilis; in 25 years' experience he has never encountered the Argyll Robertson pupil in a non-syphilitic individual. He points out, however, that isolated cases have been recorded by Mees, Margulies, Nonne and others, in which such phenomenon occurred in chronic alcoholics, and in which there was no history of syphilis; and no evidences of its existence were revealed by examination of the blood serum and cerebrospinal fluid. Other instances of loss of the pupillary light reflex have been recorded in syringomyelia by Dejerine and Miraille and others, disseminated sclerosis by Van Rad, in diabetes by Biermann, in head injury by Guillain, Franke and others, and in pineal gland tumor by Southard. The statistics that have often been cited to support the statement that such pupils occur in non-syphilitics, but in which the blood serum and cerebrospinal fluid have not been examined are useless. It may be said that the Argyll Robertson pupil bespeaks the existence of previous or existing syphilitic disease of the central nervous system, though, like all rules, this one may have exceptions.

It is generally held that the prognostic significance of these pupils is grave; and that it heralds, often a long time in advance, the coming of tabes and general paresis, and other serious cerebrospinal manifestations of syphilis; this is not always the case, and the writer cites instances of 22 individuals who have had such pupils for upward of five years, without any indication of active syphilitic disease of the central nervous system.

Taking up the subject of syphilitic eye muscle palsies the writer asserts: that the frequency with which functions of the cranial nerves are disordered in syphilis of the brain, has been habitually overstated by writers. In the 790 cases upon which this study is based there was a history of diplopia in 150 cases, i. e., in about 20 per cent; and in only one-half of these were there evidences of third nerve involvement when the patient was examined. In other words, the ocular palsies of syphilis of the nervous system are often transitory and disappear spontaneously or therapeutically. They are often the earliest symptoms, especially of tabes and basilar meningitis. Besides usually transitory and amenable to treatment they are generally partial; in comparatively few instances are they permanent; in the majority of cases they are not, as formerly held, predominately of nuclear origin.

Regarding the particular nerve involved, the third was partially or completely paralyzed in 62 instances (on both sides in only 5 examples, contrary to the opinion of Uhthoff that bilateral involvement was almost as common as unilateral). The sixth nerve was affected 31 times in this series of 790 cases; and the fourth nerve was the seat of palsy in only 5 instances. As a rule, syphilitic paralysis of the third nerve is not only unilateral but partial. The explanation of this is that the lymphocytic infiltration which constitutes the essential pathologic lesion of syphilis of the nervous system may vary in size, intensity and extent; total paralysis is usually either the expression of gumma which causes compression of the trunk of the motor oculi nerve, at some place during its intracranial transit, or of an extensive basilar meningitis.

Eye muscle paralysis may occur alone or in combination with paralysis of other cranial nerves; sometimes no involvement of the nervous system is found, save an isolated ptosis or abducens palsy. Oftentimes one finde peculiar combinations of disturbances, that remain after a double-sided ocular palsy; for instance, patients who are unable to look upwards, and when they try to do so convergence results, and when they try to converge they cannot. Lipschutz gives the following explanations of this: In these patients there was originally complete oculomotor paralysis, so that they could neither look up nor converge. As a part of the restorative process new fibers grew out of the central stump. These new fibers did not, however, reach the muscle for which they were originally intended; they were deflected, and instead of going to the rectus inferior they went to the rectus internus. When the patient makes the effort to look upward the impulse goes through the internus instead of the inferior. This interpretation of Lipschutz seems to have been accepted in a way by ophthalmologists. But it is not characteristic of syphilitic lesions. It may occur in any disease that distroys the roots of the nerve while the nuclei are preserved.

Regarding syphilitic infection of the optic nerve, Collins found that this occurred more frequently than was expected, and in 95 cases of the entire number there was disease, either inflammation, choked disc or atrophy, postneuritic or simple. It is strange and inexplicable that optic nerve atrophy is rarely observed in general paresis, and this was illustrated in the writer's series of cases by finding but one instance of this anomaly. The affection of the optic nerves in syphilis of the brain, whether it be choked disc, optic neuritis or atrophy, may be the result of increased intracranial pressure, the direct effect of the meningeal proliferation or pressure from a gumma.

It may likewise be due to syphilitic disease of the brain, especially of the anterior quadrigeminal or the geniculate body. Involvement of the trunks of the optic nerves may take place at any part of their course, but they are most liable to the affected at the chiasm, and the changes that take place in the fields as well as in the nerve itself are most variable.

Finally the writer takes up the question of the amenability to treatment of the nervous diseases of the eye due to syphilis. He has never seen an instance of disorder of the pupils caused by syphilis of the nervous system disappear spontaneously or under treatment. Some of the muscle paralyses yield to treatment readily, others are most rebellious. The important matter is to distinguish one from the other.

"In a general way it may be said that the vast majority of cases of muscle paralysis associated with symptoms that justify the diagnosis of meningitis, especially those coming on abruptly, yield to treatment or recover spontaneously. On the other hand, those due to nuclear lesions (which are apt to develop insidiously) are rebellious and unamenable, but the majority of permanent ocular palsies are not of nuclear origin.

Some of those that are nuclear at the end of life may have once been radicular.

Some eye palsies are dependent upon destructive lesion of nerve bundles that cannot be regenerated. The longer an ocular palsy has been in existence the more unfavorable, as a rule, is the outlook."

Optic neuritis and choked disc, unaccompanied by symptoms of increased intracranial pressure, often disappear almost magically under appropriate treatment. Collins has never seen a case of primary atrophy yield to treatment, nor has he seen optic neuritis develop after the use of salvarsan. In conclusion he calls attention to the fact that ophthalmologists have a unique opportunity to aid in the early detection of syphilis of the nervous system. Patients who show pupillary anomalies, particularly in size, contour and responsiveness to light, should be counseled to report to their physicians for examination of the blood serum and cerebrospinal fluid, with the same seriousness as they are sent for investigation of the urine when retinitis albuminurica is found. No case of disease of the nervous mechanism of the eye that has its origin in syphilis should be considered beyond recovery, or unsuitable for treatment, save primary nerve atrophy that has gone on to completion.

CARL L. LARSEN.

THE SECRETORY PRESSURE OF THE LIVER WITH SPECIAL REFERENCE TO THE PRESENCE OR ABSENCE OF A GALLBLADDER: F. C. Mann and J. P. Foster (American Journal Physiol, 1918, xlvii, 278-282) states that previous work by Judd and the author had demonstrated that the extrahepatic ducts

dilate after the removal of the gallbladder. This result seemed to be due to interaction of the pressure exerted by the liver and the sphincter at the duodenal end of the common bile duct. It seemed desirable to know whether the secretory pressure of the liver varied in species of animals with a gallbladder from those without one. Previous work on the secretory pressure of the liver is reviewed. The pressure was measured in the rabbit, guinea pig, striped gopher and goat, species that possess a gallbladder, and in the white rat and pocket gopher, species that do not possess a gallbladder. From the results of the experiment the following conclusions were made: (1) The secretory pressure of the liver was found to vary considerably in the various species of animals. The reason for this is not clear; there may be many causes, however, the presence or absence of the gallbladder does not seem to be one of them. (2) The secretory pressure of the liver appears to be somewhat greater in unanesthetized animals than in those under an anesthetic, but since the data obtained on anesthetized animals were only comparative, the conclusion that the presence or absence of the gallbladder bears no relation to the secretory pressure of the liver is justified.

SPLENECTOMY FOLLOWING RADIUM TREATMENT FOR MYELOCYTIC LEUKEMIA: H. Z. Giffin (Presented before the Association of American Physicians, Atlantic City, N. J., May 7, 1918) states that the operative mortality of cases reported in the literature of splenectomy for myelocytic leukemia has been extremely high (85 per cent). The remarkable remissions, brought about by radium exposures over the spleen alone in the series of cases reported from the Mayo Clinic encouraged the trial of splenectomy in certain cases at a time when the spleen is relatively small and the general condition of the patient good. The spleen was removed in eighteen instances after it had been reduced by radium. One patient died, an operative mortality of 5 per cent. Nineteen of the twenty patients were operated on during the last twenty months. Nine have since died, ten are living, most of them in very good condition. The total duration of the disease in eight of nine patients who have died was two years or more. The total duration of disease in six of the ten patients who are living, is less than two years. It is fair to assume that the duration of disease bears the only definite relationship to the length of life after splenectomy. There is no definite variation, from the life expectancy for the disease. Six of seven patients operated on within the first six months of onset are living, but no conclusions can as yet be drawn from this fact. Four patients with a chronic type of the disease showed a total duration of the disease of from six to ten years. It may be concluded that in certain chronic types of fibrous spleen and low leukocyte count, splenectomy, after proper reduction of the spleen, may be warranted from the standpoint of the patient's comfort. In the author's opinion a review of the series at this time reveals no reason to believe that the duration of the disease is altered in any definite way by splenectomy.

BOOK REVIEWS

MEDICAL WAR MANUAL NO. 5. Lessons from the Enemy. (By JOHN R. MCDILL, M. D., F. A. C. S., Major Medical Reserve Corps, U. S. Army. Illustrated. Published by Lea and Febiger, Philadelphia and New York, 1918. Price, $1.50.)

The author, after having had an opportunity for medical service in this war in England, France, Germany and Austria, selected Germany as the most interesting field in which the American army had no military medical observer, and one about which least had been written in spite of the much vaunted efficiency of German methods. He accepted accordingly the directorship of a unit financed by a German-Austro-Hungarian society of Chicago, and to comply with the neutrality proclamation of the President, resigned his commission in the Medical Reserve Corps with the understanding that he would be commissioned immediately on his return. He arrived in Germany in June of 1916 and secured permission to study the German military medical department, spending time on the Western front and also the Eastern. He was struck with the preparedness of the Germans for this war and that many of the amazing things accomplished by the German army were based on their adaptation of American ingenuity. The surprises first practiced by the Germans he noted were later adopted, improved and turned against them with full-fold efficiency despite the tremendous odds against which the Allies fought.

The "German medico-military organization in war, is carefully studied as is the "sanitary service in the German army." The "military base hospitals in Germany" are discussed thoroughly, but the "medical and surgical aspects of the war" are only superficially touched upon as would be expected when one considers the rapidly improving character of the purely professional work.

"In addition to the minutely thought out official sanitary corps with its punctiliously drilled personnel and its perfect equipment, there was a vast system of semi-official and volunteer relief organization ready to be put into service at the first call for mobilization." This system is considered thoughtfully.

About one-third of the book is given over to the "re-education of the war disabled," "the orthopedic hospitals, schools and workshops" and "artificial limbs or protheses." An appendix shows blanks, circulars, etc., used in this connection.

The author calls attention to the German organized community life for health in peace and in war, to the use which each person is put to for common good, according to the peculiar fitness of the individual; the preparation which is made to supply the necessary replacement for each man when his fitness for a certain line of work is no longer shown and the transfer of the replaced individual to something else.

A prophetic and warning note is sounded that after the war America can not disregard the appeal that will be made to her for help, due to the loss of medical men,

the failure to keep up the supply by education and a consequent shortage of modernly trained doctors; that America must realize this gigantic duty and wonderful opportunity which lays on her medical profession to care for her national health and to assist devastated Europe; that America must prepare herself now by increasing and strengthening the countries' centers of medical, surgical and sanitary education, supplying them with students.

C. E. SMITH, JR.

THE SURGERY OF ORAL DISEASES AND MALFORMATIONS. Their Diagnosis and Treatment. (By GEORGE VAN INGEN BROWN, D. D. S., M. D., C. M., F. A. C. S. Third edition. Eith 570 engravings and 20 plates, and a selected list of examination questions. Published by Lea and Febiger, Philadelphia and New York, 1918.

This work, like its predecessors, is profusely illustrated by many original drawings and cuts, and the author has also drawn largely upon the work of other authors in order to enhance this feature of the work. The author's training in dentistry gives the orthodontic features of the work special value and, to those desiring reference to this field, the book should prove helpful.

The subject of anesthesia is touched upon, a variety of methods being mentioned with such brevity that the reader will be compelled to look elsewhere for authoratative information concerning this subject. To illustrate: Novocain is referred to only conjointly with stovain and its almost universal acceptance as the best and only anesthetic for a large variety of oral and dental work is not even intimated.

Attention very naturally is focussed on the section upon Harelip and Cleft Palate, to which the author has devoted approximately 76 pages.

Under Etiology, "maternal impressions" is given considerable prominence and it would seem that the author had not sufficiently emphasized the fact that "maternal impression" is not considered good form at this time in the best scientific circles.

In laying down the principle of treatment, the text shows no change from the last edition. The same arguments are presented in an effort to show that early operation upon the lip, or reposition of the separated maxillary bones, is bad practice. To one who is familiar with the work of Brophy, and who has examined and talked with adults who were operated upon in infancy, by him it is difficult to understand why his work should be so unequivocally condemned. Assuming that the principle of early reposition of the maxillary bones by wiring followed soon by the closure of the lip, is wrong, it is to be regretted that the author finds it necessary to present cuts of patients who had had the misfortune to lose portions of the jaws and lips from sloughing. Quite naturally, the presentation of cases of this kind, which do not in any manner reflect the outcome of the normal wiring operation, may fail to convince the reader that the early restoration of the bones, which promote their union and bring the nose into the center line, is bad practice.

For the palate operation, the lateral incisions are recommended, although it is quite definitely proved that that is unnecessary in the vast majority of cases. Lead plates in this situation are condemned on account of their uncleanliness, while silver plates of the author's design are recommended. It is difficult to see the philosophy of this, and one is constrained to feel that the application of lead plates, as designed many years ago by Brophy, differs very little from the method proposed by the author, from the standpoint of uncleanliness.

Thirty-six pages are given over to War Surgery, in relation to facial injuries, and much of value appears here.

An appendix appears at the end of the book giving a list of examination questions, which invites mental exercise on the part of the student and is an innovation.

R. E. FARR.

MEDICAL WAR MANUAL NO. 6. Laboratory Methods of the United States Army. (Compiled by the Division of Infectious Diseases and Laboratories. Office of the Surgeon-General, War Department, Washington, D. C. Illustrated. Published by Lea and Febiger, Philadelphia and New York, 1918. Price, $1.50.)

Members of the Surgeon-General's staff drawing freely on standard large works have compiled this volume as a handy manual for use in the Army laboratories of the various cantonments and elsewhere. Its purpose is to serve as a guide and to make uniform the methods of procedure. With this aid it is hoped to simplify the routine for various members of the Medical Reserve Corps as they be transferred from one station to another without curbing originality.

The directions for securing specimens are brief and to the point. The methods given for preparation of media stains, etc., are succinct. The steps of the various tests are carefully outlined.

The book should fill the purpose for which it was written admirably and in addition will be of great value to physicians in civil life who do their own laboratory work.

C. E. SMITH, JR.

GYNECOLOGY. (By WILLIAM P. GRAVES, A. B., M. D., F. A. C. S., Professor of Gynecology at Harvard Medical School; Surgeon in Chief to the Free Hospital for Women, Brookline; Consulting Physician to the Boston Lying-In Hospital. With 368 half-tone and pen drawings by the author. Second Edition, thoroughly revised. Published by W. B. Saunders Company, Philadelphia and London, 1918. Price, $7.75.)

Although but two years have elapsed since the work first came out, the author has found it expedient to re-write and considerably amplify the section on the relation of gynecology to the internal secretions. Also a new part has been introduced dealing with the relationship gynecology bears to the sex impulse as advocated by Freud. Many new figures, too, have been added, the drawings for which, like most of the illustrations in the book are the handiwork of the author himself. The volume is indeed a masterpiece, full and complete, yet concise and to the point.

F. E. LEAVITT.